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OF SCIENCES

PROCEEDINGS

OF THE

Boston Society of Natural History.

VOL. III.

1848 TO 1851.

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PROCEEDINGS

OF THE

BOSTON SOCIETY OF NATURAL HISTORY.

TAKEN FROM THE SOCIETY'S RECORDS.

January 5, 1848.

The President in the Chair.

The Society met for the first time in their new Hall, in Mason Street. A large number of members was present.

The President congratulated the members on the agreeable circumstances under which the first meeting of the new year was held. He remarked, that the Society had struggled long under the difficulties imposed by narrow means and limited accommodations, yet it had in past years proved itself active and energetic, and had labored well, and contributed its share towards the advancement of Natural History. He hoped it would go on with renewed zeal and vigor for the future, and, under more favorable circumstances and increased means of usefulness, would not permit the achievements of its maturity to contrast unfavorably with those of its youth.

Dr. Storer corrected the record of the last meeting. His statement that the *Carcharias obscurus* was the only Shark of our waters with serrated teeth arose, not from any doubt that the teeth of C. *ceruleus* were serrated, but from a doubt whether that species was an inhabitant of our waters. He has not known of any individual of that species having been taken in our waters; but he had been told, though not by that gentleman himself, that Prof. Agassiz has a specimen so taken.

Dr. Gould stated that the singing Mouse, caught in Boston, which he had exhibited at the last meeting, whose performance at that time had been rather feeble, had afforded a sufficient excuse by producing the next morning three young ones. Dr. G. had hoped to have preserved them, to ascertain if they possessed their parent's musical powers; but they had all been destroyed by the mother, who has since sung almost incessantly, and with more vigor than before. Dr. G. said he had not yet ascertained by what means the sounds were produced, but thought they might be made by the labial fissure.

Mr. Desor remarked, that the power of a mouse to utter musical sounds was in analogy with a similar faculty possessed by another family of the Rodentia, the Marmots, to which it has long been known to belong.

The President exhibited casts of the Bones of *Dinornis giganteus*, and compared them with those of the Ostrich and Dodo. He also gave a sketch of Mr. Owen's latest observations on the subject of the last-mentioned bird, and the *Apteryx* of New Zealand.

Mr. Stodder exhibited specimens of manufactured *Gutta Percha*, and made some observations upon its properties.

Mr. Desor, lately observing a luminous spot at night in the waters of Boston harbor, took a boat and went to the place, and obtained a bucket full of the water. It was found abundantly stocked with crustacea, drawings of some of which, as displayed by the microscope, were exhibited by Dr. Gould. One of them appeared to be *Calanus arietis*, Templeton.

Mr. Desor remarked, that the light was of a bluish tinge, and is, as he conceives, dependent on the will of the animal.

Dr. Storer exhibited a Fish, of the genus *Motella*, to which he had given the name *caudacuta*. He remarked,

"This genus has been unknown to the waters of North America until I received the specimen which I now exhibit. Two specimens were cast upon the beach at Long Point, Provincetown, in November last. Capt. Atwood brought me one of them, which I determined a new species, and have called *caudacuta.* In some respects it agrees with Parnell's M. *cimbria*, or *four-bearded Rockling*, but differs in several important particulars. The form of the tail furnishes the specific name."

Mr. Ayres presented specimens of two species of Fish *Aphrododerus Sayanus,* which Dr. Dekay says he has never seen, although this specimen was taken within a short distance of Dr. D.'s house; and *Leuciscus nasutus,* from Hampden county, Mass. The individual presented was the one from which Mr. Ayres constituted the species.

Dr. Gould made some remarks upon the importance of depositing in public cabinets, whenever they could be procured, the identical specimens from which species had been described, and also of authentic specimens labelled by describers themselves, and of so designating them that the fact should appear. He hoped the practice would prevail among naturalists.

Mr. J. D. Whitney exhibited and described *Jacksonite,* a new mineral from the Lake Superior region.

The analysis of the ignited mineral gave

		Oxygen.	Ratio.	Calculated.
Silica	46.12	23.96	3	46.17
Alumina and a little $\dddot{\mathrm{Fe}}$	25.91	12.09	$1\frac{1}{2}$	25.68
Lime	27.03	7.90	1	28.14
Soda	.85			
	99.91			

The oxygen of the silica, alumina and lime being as $3 : 1\frac{1}{2} : 1$, or $6 : 3 : 2$, the formula will be

$$\dot{\mathrm{Ca}}^2\,\dddot{\mathrm{Si}} + \dddot{\mathrm{Al}}\,\dddot{\mathrm{Si}}$$

This, it will be perceived, is the formula which is given by

Walmstedt for Prehnite, except that it contains no water. The Jacksonite, dried at 100° C., was found to contain less than $\frac{1}{10}$ per cent. of water. The ratio of the oxygen in this mineral is an unusual one, and had led Berzelius to adopt another formula for Prehnite.

Dr. Cabot announced the donation from Mr. James Richards, of a fine specimen of the Wandering Albatross, *Diomedea exulans*, Lin.

Mr. Sharp presented a Seed-vessel of *Nelumbium luteum.*

Messrs. Junius Hall and Horatio Bigelow were elected members of the Society.

Dr. Storer offered the following resolutions, which were unanimously passed.

Resolved, That the heartfelt thanks of this Society be presented to those gentlemen whose munificence has enabled us to call this temple our own.*

Resolved, That we will endeavor to prove our sense of obligation by a renewed devotion to the cause of science.

Resolved, That we deeply feel the kindness and liberality of George M. Dexter and Edward C. Cabot, Esqrs. in advising and aiding in the architectural arrangements of our building; and most especially do we feel indebted to N. B. Shurtleff, M. D., for the skill he has exhibited in adapting, and the zeal and fidelity with which he has for months superintended the advancing work.

Dr. Storer remarked, that there were many individuals whom it would be grateful to his feelings to thank, by name, for the aid they had rendered in money and labor in the accomplishment of the work. But, as he could not name some and omit others, without injustice, he forbore. There was, however, one individual, whose services had been so efficient, that it might truly be said that without him the enterprise could not have been accomplished. He meant the President of the Society. He was sure that every member must feel how deep was our obligation to that gentleman.

The Secretary offered the following resolution, which was adopted.

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* The sum of $28,660 was contributed for this purpose, mostly by the persons whose names have been given on the first page, as Patrons of the Society.

Resolved, That each individual member be requested to consider what books, if any, he can spare from his private collection, and make more extensively useful by adding them to the Library of the Society; and that he be requested so to deposit them, either as a gift or under such conditions as he may see fit.

January 19, 1848.

The President in the Chair.

A large number of members present.

Dr. Kneeland read an account of a dissection by him of the organs of an Alligator, which died recently in this city, from injuries received by falling out of a window. Paper referred to Publishing Committee.

Dr. Gould made some remarks in regard to the phosphorescence of animals, alluded to at the last meeting, and the experiments and conclusions of Prof. Matteucci with reference to it. Prof. M. had placed glow-worms in oxygen gas and in atmospheric air, both the entire bodies and the luminous portions only. After the luminosity was extinguished, he found the air had lost oxygen and gained carbonic acid. Hence he concluded that a real combustion takes place.

Dr. Gould thought the experiments indecisive, inasmuch as the effects observed were precisely those of respiration, for which no allowance had been made. It did not appear that the same results would not follow from placing any other insects under the same conditions. In some of the experiments, parts of bodies only were used; yet the bodies of insects being provided with air-tubes and ganglia throughout their whole length, portions of them for some time after separation would still produce the effect of the entire body, on the surrounding air.

Dr. Cabot remarked, that fire-flies leave a line of light on any surface upon which they may be rubbed. The odor of fire-flies, he said, resembles that of phosphorus. He regarded their light as analogous to that of phosphorus.

Dr. C. T. Jackson mentioned having heard Prof. Hare, of Philadelphia, speak of experiments he had made on fire-flies. He had placed them in oxygen gas, but did not find that their light was increased thereby. Dr. J. thought the odor to resemble that of ozone, the odor which accompanies the development of electricity, to which, in his opinion, the light of fire-flies was owing.

Prof. Rogers remarked, that the point of combustion varied very much in different bodies. In some it was very low ; so that it was difficult to pronounce in all cases that it did not exist.

Mr. Teschemacher exhibited several fine specimens of the fossil vegetation of the anthracite coal, with sections and portions of the leaves of recent palms, part of them artificially carbonized, in order to show the analogy between their structure ; particularly as respects the character of the transverse vessels. One of the specimens exhibited the internal part of a portion of a very large leaf (?) lying parallel with, and only one-fourth of an inch distant from a mass of stem of Sigillaria, probably belonging thereto.

He remarked, that the specimens on the table were but a small portion of the new and undescribed forms of vegetation he had discovered in the coal ; that in these the impression of form or outline was not the most important evidence, for here was the identical substance of which the plants were composed, carbonized certainly, but nearly as perfect in the form of cell and vessel, and in their relative position to each other, as when the plants were in existence. He made various other observations on the subject, and finally remarked, that although extremely averse to theorizing in the present infancy of science, he could not avoid stating his investigations thus far had inclined him to the opinion of those geologists who considered the anthracite anterior to the bituminous coal formation. Beyond this, he thought the result of these investigations might show the anthracite to have undergone much more intense pressure than the bituminous coal, and to be composed chiefly of large non-resinous acotyledonous and monocotyledonous plants. That the subsequent appearance of the resinous coniferæ, &c. pervading the whole bituminous formation, was a step, perhaps not the first, in the progress of the vegetable creation towards, he would not say those more perfectly developed forms, but towards those dicotyledonous forms of the present day possessing more functions, and qualities more adapted to the use of the animals, terminating with man, which were to appear on the globe ; a progress somewhat analogous to that supposed to have taken place in the animal creation.

He much regretted that the want of books, of living and dried specimens of tropical acotyledonous and monocotyledonous plants, particularly of Palms and Gramineæ, and of a proper microscopical apparatus, impeded his further and more minute investigation of this interesting subject.

Prof. Rogers hoped Mr. Teschemacher would persevere in the investigation. Books could and ought to be procured. He offered from his own collections, made in Pennsylvania, an abundant supply of specimens. On the subject of the relative ages of the anthracite and bituminous Coals, he could not agree with Mr. T. He thought his own and his brother's researches in Pennsylvania had demonstrated the parallelism of the two kinds, and the progressive augmentation of bitumen as you advance towards the west.

Dr. Gould exhibited specimens of *Bulla solitaria*, from Plymouth Beach, collected by Rev. Mr. Hincks, who found them in great numbers. Dr. G. was not before aware of the existence of this shell in that locality. It had been found at Newport, R. I., and Roxbury.

He also presented, on behalf of B. A. Gould, Esq., a portion of the Jaw of a Skate, *Raia ocellata*, and a specimen of *Phrynosoma orbiculare*. Also, an *Agama* from Prof. Cleveland, of Bowdoin College.

Dr. Bacon exhibited masses of Gutta Percha, to show the appearances which had been mistaken for wood and bark.

Mr. Teschemacher reported on the Seed-vessel of *Nelumbium luteum*. Mr. Ayres remarked that the plant was found as far north as Connecticut, in a pond in Middle Haddam, in that State.

Messrs. John B. Kettelle and John C. Dalton, Jr. were elected members of the Society.

On motion of Mr. Teschemacher, it was

Voted, That the thanks of the Society be presented to Dr. Storer, Dr. Cabot, and their associates of the Committee who have labored with so much earnestness, perseverance, and success, to raise funds for the purchase and adaptation of the building in which we now meet, for the use of the Society.

A specimen of *Tillandsia usneoides*, taken from a live-oak tree growing at Bona Vista, about three miles from Savannah, was presented by George Griggs, Esq.

February 2, 1848.

The President in the Chair.

Seventeen members present.

Dr. Stone read an extract from the Penny Cyclopedia, on *Lampyris noctiluca*, the Glow-worm, in which detonation of hydrogen gas was said to have followed an immersion of one of them in it.

Dr. Gould considered the phosphorescence of insects as analogous to the luminous appearance sometimes presented by putrefying fish, rotten wood, &c. He stated that Prof. Agassiz was at present engaged in investigating the subject. The President remarked, that Prof. A. had, in a recent lecture, spoken of the coincidence of the luminous portion with the position of the nerves, seeming to indicate a connection between the luminosity and nervous action. Dr. Gould reminded the Society of the fact that the electric power of certain animals also rested in the nervous system.

The President compared the head of an Albatross with the cast of that of a Dodo, and pointed out a general resemblance between them. Dr. Cabot remarked that the head of the Dodo strongly resembled that of some of the Doves.

Mr. Desor stated that among the various animals that he had procured lately by dredging in Boston harbor at a depth of twenty-five or thirty feet, there were many specimens of a small Star-fish, probably a new species, of the genus *Echinaster*, nearly allied to the European *E. sanguinolentus*.

Several specimens of these star-fishes carried around and before their mouths large bundles of small yellow bodies, of the size of small pins' heads, which were the eggs. An interesting fact is the existence of a strong maternal instinct in these animals. On removing the eggs from the mother's embrace, she was seen to move at once directly towards them, and clasp them again.

On examining the eggs under a microscope, it was ascertained that each egg contained a large, opaque, yellow sphere, which was surrounded by a transparent fluid, similar to that which is found in the eggs of the Mollusks, and being by no means of an albuminous character. On escaping from the eggs the spheres began almost immediately to contract at one extremity, so as to form a sort of peduncle. It was no longer a simple yolk, but an embryo. The peduncle became more and more marked, and after a short time (commonly the first day) the embryo had assumed a form very similar to that of a mushroom. In the mean time there could be seen a distinct separation of the embryo into two layers, an external one, more or less transparent, and an internal one, more opaque. Both were composed of very minute nucleated cells, some having even a nucleolus.

In many cases the division into two zones may be perceived, even when the embryo is still enclosed in its shell; showing that in these lower animals the hatching does not occur at a fixed epoch of development, but that it may be considerably accelerated or retarded according to circumstances.

Dr. Storer announced the reception, from Capt. Atwood, of a Shark, captured at Provincetown, of a species which he at present considered new. It might perhaps be the same as one described by Dr. Wood, of Portland; but as his description was from a stuffed specimen, it was difficult to decide whether it related to the same fish as the present one, or not. If it did, it was far from a correct description of the fish in its natural state. The name of Dr. Woods's species is *Lyodon echinata.*

The donation of a copy of the Map of the State from the State government, was announced. The thanks of the Society were voted for the same.

Messrs. Theodore Simmons, B. H. Dixon, and John H. Stevenson, were elected members of the Society.

February 15, 1848.

The President in the Chair.

Twenty members present.

In reference to the remarks, at the last meeting, on the connection between the luminous power in animals and nervous action, the President reminded the Society of the existence of phosphorus in the substance of the brain and nerves.

Dr. Kneeland read a paper on the anatomy of the internal organs of the Shark, lately received from Capt. Atwood.

Mr. J. D. Whitney exhibited a beautiful specimen of a new mineral, *Chlorastrolite,* from Isle Royale, Lake Superior. The analysis showed it to belong to the Zeolite family.

Dr. C. T. Jackson read a paper from Dr. H. C. Perkins, of Newburyport, describing some experiments with Chloroform upon the lower animals, the result of which was to show that Chloroform had the effect to retard the circulation.

Dr. Gould expressed surprise at this result, inasmuch as it seemed different from the effect recorded by other observers;

and he mentioned that Dr. Wyman, who has been engaged in experiments of the same kind as those of Dr. Perkins, has made no mention of such an effect.

Mr. Desor gave an account of some experiments of his own with chloroform on various animals. He found the articulated animals most readily affected. *Cottus* resisted its influence for fifteen minutes. *Gammarus* was paralyzed instantly on coming in contact with a drop of chloroform ; they generally recovered after different intervals. *Asterias* was as if dead for three days, and revived on the fourth. *Actinia* was affected. In this animal nerves have not been detected, although Prof. Agassiz has discovered muscular fibres. Their being susceptible to chloroform goes to indicate the presence of nerves. As soon as a drop is put on their tentacles, long white strings come out, the Spermatophora, so called.

Dr. Gould remarked, that in examining ova, the application of chloroform had the effect of stopping the motion of the ovule. The strings mentioned by Mr. Desor, he thinks offensive and defensive organs, which the animal thrusts out when irritated. The stinging power of these animals is well known ; it is sufficient to enable them to destroy small animals, and at a considerable distance. It probably resides in these threads.

Dr. Bryant remarked, that the effect of chloroform was by some supposed to prove that the capillaries of the nerves of sensation, being very minute, were affected before those of motion.

The President remarked, that Ether belongs to the class of Excitants. The sedative effect is probably the effect of exhaustion. Ether excites to increased energy, devouring, as it were, the nervous energy.

Dr. W. F. Channing stated, that thinking it desirable to have the effect of the inhalation of the vapor of the Hypo-Nitrous Ether tested, as an opinion had prevailed that it was dangerous to life, he had tried it on himself, and found the effect extremely distressing, and such as would probably be fatal, if carried to a great extent.

Mr. Desor gave a further account of the development of the embryo of the Star-fish, in the study of which he is now engaged. The only observations we possess upon the Embryology of these animals, are those of the Norwegian naturalist, Rev. M. Sars; but these concern merely the external changes which the embryo undergoes. Mr. Desor has devoted a closer attention to the internal organization. The peduncle plays a most important part in the development of the star-fish, being a receptacle for the yolk intended for the nutrition of the embryo; in consequence of which, its volume diminishes in proportion to the growth of the embryo, until the yolk is completely exhausted, when it is taken up into the body, like a reduced hernia, and becomes part of the intestine.

After having gone through the Mushroom form, mentioned on a former occasion, the embryo assumes gradually the shape of a pentagon, the angles of which are at first very obtuse, but become more and more projecting. After a few days (commonly on the 3d or 4th) a swelling, like a transparent vesicle, may be seen at the lower part of each angle of the pentagon. This is the first indication of the tentacles. Some days after, the number of the vesicles had increased, and there were now for each angle of the pentagon three vesicles, later still five, then seven, &c., being separated by a depression, in which the first trace of the ambulacral furrows was recognized. At the same time there was a small red dot appearing on each of the terminal vesicles, which proved to be the rudimentary eyes. They are mere pigment cells. On compressing an embryo of this age, we see three separate zones; an external one, generally somewhat translucent, a second very transparent, and the internal yolk mass, which is most opaque. The same layers exist also in the peduncle.

On motion of Mr. G. B. Emerson, the thanks of the Society were voted to Dr. Shurtleff, for the great care he has taken, for the time he has given, and for the taste and skill he has exhibited, in providing for the accommodation of the Society and its Collections.

Dr. William Read was elected a member of the Society.

March 1, 1848.

The President in the Chair.

Present eighteen members.

Dr. Bacon, on behalf of Dr. Kneeland, read a paper on the Anatomy of the internal organs of the Thresher Shark, comparing them with those of the Shark from Provincetown, described by him at the last meeting.

Mr. Desor continued his account of his experiments with chloroform on animals.

Two small fishes, a Minnow and a Stickleback, were placed in a jar of water. Twelve drops of chloroform being added, in from four to five minutes they became stupefied. On being removed from the jar, they revived in from twelve to fifteen minutes. On one specimen the experiment was tried five times, with a manifestation of increased susceptibility with each repetition. The circulation under the microscope was seen to be retarded; and in one experiment, where the fish was kept in the jar forty minutes, it was brought to a complete stop. The fish was however not dead. The eye was clear, the color of the body unchanged, and it continued poised as in life, with the back uppermost. The circulation appears to cease first in the minute capillaries of the tail. The hind part of the body is generally bent. Motion in the pectoral fins ceases long after it does in the others.

Dr. Cabot read a paper on the Dodo, which Cuvier arranged with the Gallinaceous birds, and Mr. Owen has since classified with the Raptorial. Dr. Cabot classes it with the Columbidæ. His paper was referred to the Publishing Committee.

Dr. Storer stated that the Shark recently received from Provincetown, proved to be the same species as that taken on the coast of Maine two years since, and which was described and the description communicated to him at the time by Dr. Wood, of Portland. After our specimen was stuffed and dried, it proved to be the *Somniosus brevipinna*, Lesueur. Lesueur described his fish from a dried and stuffed skin, which he saw in Marblehead, in 1818. Our fish, when recent, did not answer at all to that description or figure ; but when stuffed and dried, it agreed with it perfectly. One characteristic in particular worthy of notice, the *lateral line*, scarcely observable in the recent fish, is exceedingly well marked, exhibiting the vertical bands pointed out by Lesueur. These three specimens, Lesueur's, Dr. Wood's, and the one belonging to the Society, are all the *Somniosus brevipinna*, the Nurse or Sleeper Shark.

Prof. Rogers made some remarks upon the Infusorial deposit at the mouths of rivers in the Southern States. On the Rappahannock, York, and James rivers, these deposits are in great development. They are caused by the influx of vast numbers of marine Infusoria by the flood-tide, which, on meeting the fresh water of the river, are instantly deprived of life, and sink, leaving their silicious or calcareous covering to swell the mass of delta and raise the river bed.

Dr. Gould remarked, that not only do the Marine animalculæ perish on meeting the fresh water, but tribes of fresh water species also are destroyed by the access of the water of the ocean, and add their bodies to swell the general mass.

Mr. Desor presented some remarks on some peculiar bodies which are seen moving in the interior of the eggs of different kinds of *Eolis*, and which have been described by M. Nordmann as parasites, under the name of *Cosmella hydrachnoides*.

They are small spheres, with long, transparent threads attached to them, by means of which, with undulations like those of a whip-lash, they move about with great activity. Some observers might be led to consider them as independent existences. One might even suppose them to be the first state of those peculiar parasites which Dr. Gould has found so numerous on the appendages of the full-grown *Eolis*. But, on the other hand, when we consider that motion is by no means a characteristic peculiar to animals, there would seem to be just as good ground for considering these moving bodies with their cilia as mere cells, similar to the vibratile cells described by Henle. The fact that they are only found when the embryo is already furnished with its long cephalic cilia (cirrhi) might easily lead to the supposition that they are only similar cilia detached from the head of the embryo; which is the opinion of Vogt. At any rate, they must be proved to be animals before they can be quoted as an argument in favor of the theory of spontaneous generation. Mr. Desor exhibited to the Society these bodies under the microscope.

Dr. Cabot announced that he had procured in Boston market a specimen of *Turdus nævius*, the first of the species he had known to be procured east of the Rocky Mountains. It was shot in New Jersey.

Dr. Shurtleff announced from the publishers of the Boston Atlas the donation of their newspaper. The thanks of the Society were voted for this donation.

Dr. Gould announced the donation of a fine Collection of American Insects, from John Bethune, Esq.

Dr. G. H. Lyman was elected a member of the Society.

March 15, 1848.

The President in the Chair.

Present, twenty-four members.

Mr. Desor gave a further account of the development of the Star-fishes.

When the embryo is so far advanced that we can distinguish the ambulacral furrows with the rudiments of the tentacles, we may perceive, on compressing it, in the interior of the body, several spots of a calcareous network between the outer zone and the internal yolk mass. These calcareous spots are not scattered at random; there are generally eleven principal ones, five corresponding to the radii or ambulacres, five to the spaces between them, and a central one, the rudiment of the madreporic plate. The five interambulacral plates, which answer to the masticating apparatus in other Echinoderms, approach afterwards nearer to each other, so as to form a ring around the attachment of the peduncle; whilst those corresponding to the rays recede, and form as it were a second ring outside of the first. In the mean time new spots appear, but instead of forming outside of those already existing, they come between the two rings; so that the ambulacral spots which were at the beginning near those of the interambulacral ring, are constantly carried further from the centre. The last plate of each ray is therefore the oldest; a fact by no means extraordinary if we consider that it is connected with the eye, and protects it. In a similar way we see, in the higher animals, the hand formed before the arm and forearm. As the ambulacral plates are connected with vision, and the interambulacral plates with the function of nutrition, their early appearance may be considered as an illustration of the general law, that the most important organs are formed first.

Mr. Teschemacher observed, that in the Address, which he had the honor of delivering before the Society in 1841, and on several subsequent occasions, he had regretted the neglect, by Geologists, of the study of Mineralogy. That he had considered this study, as regards the unstratified crystalline rocks, the equivalent of Paleontology, as regards the sedimentary stratified deposits; and that he had no doubt ere long some master-spirit would derive from Mineralogy many of the safest and surest landmarks of Geology. These anticipations have been made good, in some papers read before the Geological Society of France last year.

Mr. T. gave an account of those papers. First, that of Prof. Scheerer, of Christiania, on some of the minerals in the Granite of Norway, showing the existence of primitive, basic water in them; which, in the opinion of the Professor, militated against the igneous origin of those rocks. Next, a paper by M. Virlet D'Aoust, who contends that Granite and Gneiss are the result of a " normal metamorphism " of stratified Slates and Schists. A third paper, by M. Achille Delesse, on the chemical and mineralogical character of the unstratified crystalline rocks of the Vosges, in which he arrives at the generalization, " that rocks of the same age are of the same chemical and mineralogical constitution ; and reciprocally that rocks of the same chemical and mineralogical constitution are of the same age." He enters into a minute examination of the Felspars and other minerals of those rocks, and considers that the water chemically combined in the Felspars is inconsistent with the idea of their igneous origin.

Mr. Teschemacher urged the importance of studying with minuteness the mineralogical character of the boulders of this country, before a proper comparison could be made between them and the rocks *in situ* from which they are supposed to have been separated. This he considered indispensable, before a true judgment could be formed of the means by which, and the course in which they had been moved. Mr. T. exhibited a few specimens in elucidation of his ideas.

Mr. Desor remarked on the metamorphic character of the crystalline rocks of the Alps, and the absence of Granite in those mountains. What had been called such was undoubtedly transformed sedimentary rocks. He had himself collected Belemnites in the so-called Mica-slate of St. Gothard.

Dr. Jackson said he had long been familiar with the altered or metamorphosed rocks, and had minutely described them in his State Geological Reports, particularly in that of Rhode Island, in which he had described the alterations in the shales of the coal measures. There may be seen, on the borders of the Rhode Island coal field, all the changes referred to ; and a mica-slate rock, such as is used for scythe-stones, gradually passes into a slate and sandstone rock of the coal measures. He had seen specimens like those described in Mr. Teschemacher's communication.

As to the existence of water in minerals, he would say that it existed in most volcanic minerals, and in many of those from the primary rocks, and must have been present at the time of their formation. He did not regard its presence as any proof that the minerals were not of igneous origin, for if the water was under pressure it might have been heated to a very high temperature without escaping. Indeed it is well known that water, under artificial pressure, may be heated to redness without formation of steam.

Prof. Rogers expressed the opinion that changes upon the strata resulted not so much from intrusive veins or dykes, as from the gases and steam discharged during paroxysmal action. He illustrated it by the phenomena exhibited all along the south-east side of the Appalachian chain, especially in its extension through Western Massachusetts and Vermont. The crystalline marbles of Berkshire are only the older Appalachian Limestone, (the Matinal series of his nomenclature, the Chazy limestone of the New York survey) in a metamorphic dress; their fossils obscured or effaced by crystallization. This view, long ago advocated by him, has been confirmed by the discovery, by Mr. Hall and others, of organic remains in the less altered portions of the same formations in Rensselaer county, New York. The strata equivalent to the Hudson river Slates are to be seen in the western ranges of Berkshire, altered to the Talcose and Chloritic Schists. Localities were pointed out, where the Argillaceous rocks are to be seen under the aspect of true Gneiss, and the so-called Vitreous Quartz rock appears in the disintegrated condition of a soft Sandstone. Through all this belt of country there is an almost entire absence of veins or dykes.

Prof. Rogers adverted to the progressive diminution of the bitumen in the coals of the Appalachian chain, wherever we cross the chain in the direction of northwest to southeast. This diminution reaches its maximum in Anthracites, to be met with only along the south-east side of the belt; where not only the coal, but all the formations give evidence of igneous action. Yet here are no traces of igneous, mineral injections. These facts have induced him to refer the whole change to the agency of effluent hot steam and gases, discharged during earthquake movements that elevated the whole mountain chain.

With respect to the presence of water in igneous minerals, he remarked that we should view water in its elements as among the essential constituents of the molten interior of the globe; 45 per cent. of the whole fabric visible by man consisting of one of those elements alone, viz. oxygen.

Dr. Gould presented specimens of Land Shells from the Phillippine Islands, selected from some sent to him by Mr. Cuming. They were authentic specimens, being sent by the original collector, and labelled by him. The labels were marked A, to show their authority, and Dr. G. had added some of his own, marked O, to show them to be originals.

Dr. Cabot said he had seen a specimen of the European Widgeon, *Anas penelope*, which had been shot in New Jersey ; the first instance he had known of that bird being found in this country.

ADDITIONS TO THE LIBRARY DURING THE QUARTER ENDING MARCH 31.

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. III. No. 10. July and August, 1847. *From the Academy.*

Annals and Magazine of Natural History. No. 133. October, 1847. 8vo. London. *From the Courtis Fund.*

Proceedings of the American Academy of Arts and Sciences. pp. 49 to 160. 8vo. pamph. Boston, 1847. *From the Academy.*

Gelehrte Anzeigen der Königlichen Bayerischen Akademie der Wissenschaften. 22, 23. 4to. München. 1846. *From the Academy.*

Bulletin de la Societé Geologique de France. Tome 4. Feuilles 26–52. 8vo. Paris, 1846–7. *From Soc. Geol. de France.*

American Journal of Agriculture and Science. Conducted by Dr. E. Emmons and A. Osborne. No. 18. October, 1847. 8vo. New York, 1847. *From the Editors.*

American Journal of Science and Arts. 2d Series, No. 12. November, 1847. 8vo. New Haven. *From the Editors.*

Investigations in relation to Cane Sugar, made in obedience to an act of Congress. 8vo. pamph. Washington, 1847. *From R. C. Winthrop.*

Magazine of Horticulture, &c. No. 155. Edited by C. M. Hovey. New Series, Vol. III. Nov. 1847. *From the Editor.*

Annals and Magazine of Natural History. Vol. XX. No. 134. November, 1847. 8vo. London. *From the Courtis Fund.*

Verhandlungen der Kaiserlich-Russischen Mineralogischen

Gesellschaft, zu St. Petersburg. Jahre, 1845–6. 8vo. pamph. *From the Imperial Mineralogical Society of St. Petersburg.*

Magazine of Horticulture, &c. No. 156. December, 1847. *From the Editor.*

Enumeration of North American Lichenes; to which is prefixed an Essay on the Natural Systems of Oken, Fries, and Endlicher. By Edward Tuckerman. 12mo. Cambridge, 1845. *From the Author.*

American Journal of Agriculture and Science, June and September, 1847. 8vo. New York. *From the Editors.*

Gray's Genera of Birds. Part 42, for October, 1847. *From the Audubon Fund.*

Annals and Magazine of Natural History. Nos. 135 and 136. Supplementary No. December, 1847. London. *From the Courtis Fund.*

Silliman's American Journal of Science and Arts. 2d Series. No. 13. For January, 1848. *From the Editors.*

Thomas Brown. Book of Butterflies, Sphinxes, and Moths. Vol. II. 12mo. London, 1832. *From H. H. Tuttle.*

Philosophical Transactions. Vol. I. From 1665 to 1666. *From. B. P. Haines.*

Darwin's Zoönomia. 4 vols. 8vo. London, 1801. *Presented by Dr. S. Kneeland, Jr.*

J. E. Smith. Compendium Floræ Britanicæ. 12mo. London, 1828. *From the Same.*

Darlington, W. Reliquiæ Baldwinianæ. Selections from the Correspondence of the late William Baldwin. 12mo. Philadelphia, 1843. *From the Same.*

Rousseau, J. J. Letters on the Elements of Botany. With Notes by T. Martyn. 8vo. London, 1785. *From the Same.*

Farrar, John. Elements of Electricity, Magnetism, and Electro-Dynamics. 8vo. Boston, 1839. *From the Same.*

Experimental Treatise on Optics. 8vo. Cambridge, 1826. *From the Same.*

J. Jonstoni. Thaumatographia Naturalis. 18mo. Amsterdam, 1732. *From the Same.*

Bichat. Traité des Membranes en général et de diverses Membranes en particulièr. Nouvelle edition, revue et augmentee des Notes par M. Magendie. 8vo. Paris. *From the Same.*

Annals of Botany. No. 5. 8vo. London, 1845. *The Same.*

Latreille. Memoires sur divers sujets de l'Histoire Naturelle des Insectes, de Geographie Ancienne et de Chronologie. 8vo. Paris, 1819. *From the Same.*

G. Breschet. Recherches Anatomiques et Physiologiques sur l'organe de l'Audition chez les Oiseaux. 8vo. pamph. Paris, 1836. Atlas to ditto, 4to. Paris, 1836. *From the Same.*

Manual of Magnetism, with 180 Illustrations. 2d edition. 12mo. Boston, 1847. *Presented by Daniel Davis.*

J. D. Dana. On certain Laws of Cohesive Attraction. 8vo. pamph. Boston, 1847. *Presented by the Author.*

Bulletin de la Société Imperiale de Naturalistes de Moscou. Nos. 1 and 2. Moscow, 1847. *From the Soc. Imp. Nat.*

Rapport sur la Séance Extraordinaire de la Société Imperiale de Naturalistes de Moscou. 8vo. 1847. *Presented by Charles Cramer.*

Researches into the Comparative Structure of the Liver. By Joseph Leidy, M. D. 8vo. pamph. 1848. *From the Author.*

Twenty-seventh Annual Report of the Mercantile Library Association. 8vo. pamph. New York, 1848. *From the Association.*

Outline of a Course of Geological Lectures. 8vo. New Haven, 1829. *From Dr. N. B. Shurtleff.*

J. G. Spurzheim. Observations on the Deranged Manifestations of the Mind, or Insanity. With Appendix, by A. Brigham. 8vo. Boston, 1833. *From the Same.*

Letters on Entomology for Young Persons. 12mo. London, 1825. *From the Same.*

F. J. Grund. Elements of Chemistry. 12mo. Boston, 1833. *From the Same.*

F. Accum. Practical Essay on the Analysis of Minerals. 12mo. Philadelphia, 1809. *From the Same.*

R. B. Thornton. Grammar of Botany. 18mo. New York. 1818. *From the Same.*

Domesticated Animals. 18mo. Boston, 1835. *From the Same.*

N. Boubée. Géologie Elementaire. 18mo. Paris, 1833. *From the Same.*

J. Joyce. Dialogues on Chemistry. 2 vols. 18mo. New York, 1818. *From the Same.*

J. Rennie. Alphabet of Botany. 18mo. New York, 1833. *From the Same.*

J. F. Dana. Epitome of Chymical Philosophy. 8vo. Concord, N. H. 1825.

Lavoisier. Elements of Chemistry. 8vo. 2 vols. in 1. New York, 1806. *From the Same.*

Bordeau. Dissertation sur les Eaux Minérales du Bearn. 18mo. Paris, 1750. *From Mr. S. G. Drake.*

Phillips, W. Outline of Mineralogy and Geology. 18mo. New York, 1816. *From the Same.*

Dobson, M. Medical Commentary on Fixed Air. 8vo. London, 1807. *From the Same.*

Poncelet. Histoire Naturelle du Froment. 8vo. Paris, 1779. *From the Same.*

Annals of Philosophy, Natural History, &c. Vol. 3d. 8vo. London, 1804. *From the Same.*

Pouillet. Elemens de Phisique Expérimentale et de Meteorologie. 4 vols. 8vo. Paris, 1832. *From Dr. John Bacon, Jr.*

Pursh, F. Flora Americæ Septentrionalis. 2 vols. 8vo. London, 1814. *From the Same.*

Barton, B. S. Elements of Botany. 3d. ed. 8vo. 2 vols. Philadelphia, 1827. *From the Same.*

De Candolle. Vegetable Organography. Translated by B. Kingdom. 2 vols. 8vo. 2d ed. London, 1841. *From the Same.*

Davy, H. Elements of Agricultural Chemistry. 6th ed. 8vo. London, 1839. *From the Same.*

Lindley, J. Theory of Agriculture, with Notes, &c. by A. J. Downing and A. Gray. 12mo. New York, 1841. *From the Same.*

Arnott N. Elements of Physics, with Additions, by Isaac Hays. 8vo. Philadelphia, 1834. *From the Same.*

Mrs. Somerville. Connection of the Physical Sciences. 12mo. Philadelphia, 1834. *From the Same.*

Combe, Andrew. Physiology of Digestion. 12mo. New York, 1836. *From the Same.*

Audubon and Bachman. Plates 121–125, to their Quadrupeds of America. *From the Subscribers.*

Transactions of the Entomological Society of London. Parts 2–5, vol. iv. and Part 1, vol. v. 8vo. London, 1846, 1847.

Proceedings of the Same, pp. 97–144. 8vo. London, 1847.

Address of the Rev. F. W. Hope before the Same. 8vo. pamph. 1846.

Address of Mr. George Newport before the Same. 8vo. pamph. 1845. *All presented by the Society.*

Journal of the Indian Archipelago and Eastern Asia. Nos. 1, 2, and 3. July, August, and September, 1847.

Transactions of the American Philosophical Society of Philadelphia. Part 1, vol. x. 4to. *From the Society.*

Seventy-five plates of rare, unfigured Plants, from the Linnæan Herbarium. Long 4to. *From C. J. Sprague.*

Journal of the Indian Archipelago, Nos. 4 and 5, for October and November, 1847. 8vo. pamph. Singapore. *From the Editors.*

Transactions of the Linnæan Society. Vol. XX. Part 2. 4to. London, 1847. *From the Society.*

Proceedings of the Linnæan Society. pp. 305–340. 8vo. London, 1846, 1847. *From the Society.*

American Journal of Science and Arts. Conducted by B. Silliman, &c. 2d series. No. 14. March, 1848. *From the Editors.*

J. A. Smith. Mutations of the Earth. 8vo. pamph. N. York. 1846. *From Francis Alger, Esq.*

J. Chickering. Statistical View of the Population of Massachusetts, from 1765 to 1840. 8vo. pamphlet. Boston, 1846. *From F. Alger, Esq.*

Synopsis of the Lichenes of New England, the other Northern States, and British America. By Edward Tuckerman. 8vo. Cambridge, 1848. *From the Author.*

Leidy, Joseph. On a new genus and species of Fossil Ruminantia, Poëbrotherium Wilsonii. 8vo. pamp. Philadelphia, 1847. *From the Author.*

Gray's Genera of Birds. Part 43. Long 4to. London, 1848. *Audubon Fund.*

Edinburgh Review. Vols. 80, 82, 84. 8vo. New York, 1844–7. *From T. Bulfinch, Esq.*

Travels in North America. By Charles Lyell. 12mo. New York, 1845. *From the Same.*

How to Observe. Geology. By H. T. De la Beche. 2d ed. 8vo. London, 1836. *From the Same.*

Molluscous Animals, including Shell-fish. By John Fleming. 8vo. Edinburgh, 1837. *From the Same.*

Remarks on the Geology and Mineralogy of Nova Scotia. By Abraham Gesner. 8vo. Halifax, 1836. *From the Same.*

Phrenology, in connection with the Study of Physiognomy. By G. Spurzheim. 8vo. London, 1826. *From the Same.*

Memoirs of James Jackson, Jr. By James Jackson. 8vo. Boston, 1835. *From the Same.*

Botanical Text-Book. By Asa Gray. 12mo. New York, 1842. *From the Same.*

Political Economy. By A. Potter. 12mo. New York, 1842. *From the Same.*

Discourse on the Study of Natural Philosophy. By J. F. W. Herschel. New edition, 12mo. New York. 1840. *From the Same.*

April 5, 1848.

The President in the Chair.

Twenty members present.

The President read a written report on the first volume of the Transactions of the Royal Society, which had been committed to him.

Prof. Agassiz commenced an account of the Annelida of Boston harbor, noticing particularly on this occasion the Tubulibranchiate Annelids. These animals have been classified by their branchial and locomotive appendages; but Mr. A. showed that these organs were not well adapted to form a basis for classification, inasmuch as they are transitory, are modified, or disappear, in the course of the life of the animal. He described the growth and appearance of these animals in the several genera of which he had found specimens; viz. thirteen genera, comprising seventeen species; many of which are different from the known genera of Europe.

Dr. Gould read a letter, from Dr. Perkins in West Africa, giving an amusing account of his own experience of the difficulties with which Naturalists and collectors have to struggle, in their intercourse with the natives of barbarous countries, in endeavoring by their aid to procure specimens or elicit information.

Dr. James W. Stone and Mr. John E. Williams were elected members of the Society.

April 19, 1848.

The President in the Chair.

Twenty members present.

Prof. Agassiz made some remarks on the existence of numerous minute tubes in Fishes, opening externally, which have hitherto been considered mucous tubes, but which he is convinced are tubes for the introduction of water into the body. These openings in some fishes are extremely numerous, existing over the whole external surface. In fresh water fishes, and in those living in shallow waters, they are comparatively few. They are most numerous in fishes which swim at great depths.

In reply to a question of Dr. Wyman, he said that he had not as yet found them in the sharks and rays. These openings are sometimes visible to the naked eye, and sometimes require a magnifying power for their detection. They are very large and numerous, and easily seen, in the head of the common shad. These minute tubes unite into larger ones, in a manner which seems to be the same in each class. He thought this circumstance might be of some value in the classification of fishes. The tubes grow larger and larger as they approach the heart. They open into the circulating system near the heart. Prof. A. had injected the heart through these tubes, and had drawn blood from them by a syringe. He had injected the external surface through a *single* tube, and that whether opening near the head or the tail, or in other parts of the body. He believes these tubes an apparatus for the safety of fishes living at great depths, to enable them to resist the great pressure to which they must there be subjected. He did not deny the existence of mucous tubes in fishes, for there are such, about the heads of sharks for instance, from which mucus may be obtained by pressure ; but he is sure, that what have been considered hitherto as mucous tubes are in reality water tubes.

Dr. C. T. Jackson made some remarks upon the drift scratches and cleavage planes of the Roxbury Greywacke. He gave the particulars of the directions of the scratches, and measurements of the angles of the cleavage planes. The former run S. 20° E. S. 24° E. S. 40° E. The line of fracture of the pebbles is N. 30° E.

Mr. E. C. Cabot mentioned a ledge of Puddingstone, in Brookline, at the cutting for the Water-works, conspicuously marked with scratches in a direction N. and S. 17° E.

Mr. Desor remarked of the same rock, that the scratches were found not only on the prominent parts of the surface, but also on the depressed portions, between the projecting pebbles ; while on other parts they were wholly wanting. This fact is not easily explained except by supposing that the presence of the scratching body was not great enough to affect the pebbles, which are of a harder nature than the cement between them.

Mr. J. E. Teschemacher recurred to an observation made by him at a previous meeting, respecting the process of the metamorphism of rocks, for the purpose of doing justice to the earliest efforts of this Society, as well as to the labors of one of its distinguished members. In a very long paper, read before the Geological Society of France, in 1846, entitled "Studies on the Metamorphism of Rocks," by M. Durocher, the author states, that from his own experiments he finds the mineral "Macle" to be "Andalusite," and also that the dark clay slate in which it is imbedded, and which often forms the centre of a group of crystals, exists in these centres in a pyramidal form. Mr. T. then exhibited the first number of the Journal of this Society, published in 1834, containing a paper by Dr. Charles T. Jackson, in which the latter fact is distinctly stated, and analyses given proving clearly that the "Macle" is Andalusite. The results of this paper have been copied into almost every work on Mineralogy since published in the English language; and Mr. T. expressed his surprise that a mineralogist, of so little knowledge as to claim these facts as his own discoveries, should attempt to write on a subject requiring the most extensive and acute mineralogical science.

The last investigations respecting this Andalusite were, he believed, by Svanberg and by Erdmann; their analyses agreed with those of Dr. Jackson as nearly as could be expected from analyses of a mineral from different localities and so closely imbedded as the Macle.

Mr. T. thought that the expression of the opinion of M. Durocher, that the Macle was the clay slate metamorphosed, ought to have been accompanied by accurate analyses of the slate, particularly of that part immediately in contact with the mineral, in order to afford comparison of its ingredients with those of the Andalusite.

He made several other observations on metamorphism, and urged the necessity of accurate analyses of the various rocks. He did not think the idea of Mr. Durocher, of the resemblance of the process of metamorphism to that of the cementation of iron, well founded.

Mr. Teschemacher observed that he had collected and measured many specimens of the cleavages of sedimentary rocks, both clay slates and sand stones. Amongst them were forms varying very considerably in their angles. In all these the cleavage was clear. Each piece, however small, could only be cleaved into similar forms, and one set of faces could be more readily produced than another, precisely like many regular crystalline bodies. He thought therefore that the particles of these rocks, like the atoms of crystals, had taken their places during their deposition, according to exact laws, and that this idea derived much support from the recent discoveries of Faraday, that all bodies possessed inherent magnetism of a certain intensity. There was no reason to suppose that a grain of silex, forming a portion of a sedimentary rock, should not still be possessed of the original qualities by which it took a crystalline form.

Prof. Rogers presented a specimen of altered Rock, from New Hope, on the Delaware. At this place a dyke of Greenstone passes through the Argillaceous Red Shale, within an hundred feet of which specks or centres of imperfect crystallization are perceptible, and nuclei of Epidote and Tourmaline. The sedimentary rock assumes the appearance of Greenstone. He also spoke of the rocks at Newton Tunnel. An Agillaceous Sandstone is there seen altered to Porphyry. The original bedding is uneffaced. Prof. R. made some remarks on slaty cleavage; and promised to go more fully into the subject at a future meeting.

Dr. C. T. Jackson read from his note-book notices of experiments on solutions of Gun-cotton, which had been read at the meeting in January, 1848, but had not been particularly recorded.

The date of the entry is Dec. 20, 1847, and it is as follows: "Tried the solubility of my Gun-cotton. That of one hour's immersion will not dissolve in ether, and does not lose its explosive quality when dried. That of twelve hours' immersion dissolves quickly and entirely in sulphuric ether, and numerous bubbles of oxygen disengage from the dissolving mass. The ether solution is an excellent cement and varnish. It dries into a pellucid substance, like horn; and when dried more, turns white. It is not explosive; but an immersion in the mixed acids renders it so again readily. Its ethereal solution is precipitated by water, white and flocculent. Acids will not dissolve it, nor will boiling water; but the latter renders it hard, or rather excessively tough. Paper immersed in the ethereal solution, became glazed, and is good for writing."

Mr. Ayres, on behalf of Dr. Storer, exhibited a figure, with a description, of a new genus of Fish, *Blennius ser-*

pentinus; so named by Dr. Storer, who had received it from Capt. Atwood, who took it from the stomach of a cod.

A cast of *Isotelus gigas*, and tail of *Asaphus*, with eye and mouth pieces, was laid on the table, and committed to Dr. Wyman.

Dr. Kneeland placed on the table several Skeletons, presented by Mr. Ogden. They were as follows: Numidian Crane, Civet Cat, South American Monkey, Humming Bird, King Charles's Spaniel, and the Skull of a Chinese Dog. He also presented, from Mr. Ogden, a Bird of Paradise, mounted by him. On motion of Dr. Cabot, the thanks of the Society were voted to Mr. Ogden for this donation.

Dr. William Keller, of the Cambridge Scientific School, and J. Wingate Thornton, Esq., were elected members of the Society. Dr. Siedhoff, of Newton, was elected a Corresponding member.

May 3, 1848.

ANNUAL MEETING.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, twenty-one members.

A portion of the record of the last Annual Meeting was read by the Secretary.

The Curators presented and read their Annual Reports, of which the following is an abstract.

The Curator of *Herpetology* reported, that the additions to his department during the past year, had been few. The more liberal accommodations of the new hall, however, afforded him an opportunity of placing many specimens on the shelves, which have hitherto been kept out of sight for want of room. The Collection is particularly deficient in specimens from the Southern and Western parts of North America.

The Curator of *Comparative Anatomy* reported the addition, during the past year, of several very valuable specimens in his department.

The Curator of *Mineralogy* reported, that of the specimens in his department belonging to the Society, eight hundred only were thought worthy of a place on the shelves in the new building, where they have been deposited and classified. By permission of Mr. Alger, he had selected from his cabinet eighty duplicate specimens, which he now presented in his name. He had also made choice of $50 worth of minerals, from a quantity deposited with Mr. Alger on sale, to be paid for from the money subscribed in aid of the Society at Mr. Alger's solicitation.

The Curator of *Ornithology* reported, that there have been presented, by various individuals during the past year, eighty Birds. He proposes to present, from his own Collection, over one hundred specimens as soon as funds can be procured to defray the expense of mounting them.

A valuable collection of Birds' Eggs has been received from G. A. Bethune, Esq. All the Bird Skins belonging to the Society have been mounted and put in the cases. The whole number is about six hundred and eighty. The Curator had, by his own effort, raised a subscription of $120, to aid in defraying the expense of mounting the specimens under his charge. Donations to this department during the past year have been received from Major Townsend, Messrs. G. M. Dexter, E. C. Cabot, W. Sohier, Robbins and Ogden, and Drs. Cabot, Shurtleff, Read, and Abbot.

The Curator of *Ichthyology* reported, that the Cabinet under his charge is not in so perfect a condition as it was several years since, owing to the losses produced by the ravages of insects and the means used to eradicate them. Several fine specimens have however been received from Capt. N. E. Atwood, of Provincetown ; among them *Somniosus brevipinna*, and a new species of *Blenny* and *Motella;* the latter two genera being new to the waters of Massachusetts.

The *Librarian* reported, that during the past year there had been received 120 volumes, and 102 pamphlets and parts of volumes, most of them donations from friends of the Society; among whom he mentioned the names of the late Hon. Judge Davis, (who by his will authorized us to select twelve volumes from his valuable library), Alcide D'Orbigny, Akademie der Wissenschaften zu München, Drs. Kneeland, Shurtleff, and Bacon, Thomas Bulfinch, Esq., and the subscribers to Audubon's Quadrupeds of America. The whole number of volumes in the Library is 1260, pamphlets and parts of volumes 120. Abundant space is afforded in the new Library room for at least 10,000 volumes.

The Treasurer reported, that during the past year,

The amount received from general sources was		$1,288 96
Amount expended for general purposes		1,300 35
Balance due him		11 39
Amount received from trustees of Courtis Fund		1,103 56
“ paid from Courtis Fund		450 73
Balance due to Courtis Fund		652 83
Amount received from subscribers to building		26,999 75
“ paid towards building	20,000 00	
“ paid on account of repairs	7,257 63	
		27,257 63
Leaving a balance due the Treasurer		257 88
Total receipts		29,392 27
“ expenditures		29,008 71
Balance due from Treasurer		383 56
Owing for building	3,000 00	
Interest	425 00	
		3,425 00
Owing to Messrs. Dexter & Cabot, about		1,100 00
“ for iron shutters, say		195 00
		4,720 00
To pay which, are still due from subscribers to building		1,720 00
Balance to be provided for		$3,000 00

The Treasurer and the Committee of Finance were authorized to adopt such measures towards liquidating the debt as they might see proper.

The Society next proceeded to the choice of Officers for the ensuing year, and elected the gentlemen presented as candidates by the nominating committee, as follows:

President,
Dr. John C. Warren.

Vice-Presidents,
Dr. C. T. Jackson. Dr. D. H. Storer.

Corresponding Secretary,
Dr. A. A. Gould.

Recording Secretary,
Dr. S. L. Abbot.

Treasurer,
P. T. Jackson, Esq.

Librarian,
C. K. Dillaway, Esq.

Cabinet Keeper,
Dr. Samuel Kneeland, Jr.

Curators,

J. E. Teschemacher, Esq.	*Of Botany.*
Dr. John Bacon, Jr.	*Mineralogy.*
Dr. N. B. Shurtleff,	*Comparative Anatomy.*
W. J. Burnett, Esq.	*Entomology.*
W. O. Ayres, Esq.	*Ichthyology.*
Prof. Jeffries Wyman,	*Herpetology.*
T. T. Bouvé, Esq.	*Geology.*
Dr. Samuel Cabot,	*Ornithology.*
Dr. William Read,	*Conchology.*

Dr. Cabot, of the nominating committee, read a communication from Thomas Bulfinch, Esq., declining to stand as a candidate for the office of Recording Secretary another year, which he had filled for some years past. On motion of Dr. Storer, it was

Voted, unanimously, That the thanks of the Society be presented to our late Secretary, for the fidelity and zeal with which he has ever performed the duties of his office, and that his communication be placed on file.

On motion of Dr. N. B. Shurtleff, it was unanimously

Resolved, That the thanks of the Society be presented to Drs. Harris and Gay, for their valuable services as Curators for many years past.

Mr. J. E. Teschemacher asked the attention of the Society for a few minutes, to the following statement:

It was well known, that he had been, for two or three years, studying the vestiges of the fossil vegetation existing in the Anthracite Coal; he had, on several occasions, and particularly before this Society, expressed his opinion, that the vegetation of which the Anthracite Coal was formed, differed essentially from that forming the Bituminous Coal; this latter containing resinous woods, which were absent from the former.

He understood that Dr. Carpenter was delivering a Course of Lectures in London, on Paleontology, in which he touched on the Anthracite deposites in Wales, (Eng.) and stated his view, that the vegetation forming this deposit was non-resinous, differing from that forming the Bituminous Coal, which was resinous.

Mr. T. observed, that although this had been his opinion for several years, yet he thought it highly probable the idea was new with Dr. Carpenter, and hoped it had arisen from his study of the Welsh Anthracite; it would then be a strong presumption in favor of this view. Mr. T. thought that the fact of the alternation of Anthracite and Bituminous Coal in Wales, mentioned by Prof. Rogers at a previous meeting, was incompatible with the theory of the metamorphism of Bituminous into Anthracite Coal by igneous agency.

May 17, 1848.

Vice-President, C. T. Jackson, in the Chair.

After the Record of the last meeting had been read by the Secretary, the Annual Address was delivered by Dr. D. H. Storer. It was an interesting historical sketch of the origin and progressive growth of the Society up to the present time. Dr. Storer availed himself of the opportunity to acknowledge the indebtedness of the Society to its numerous friends and benefactors, who at all times have been ready with a liberal hand to supply its wants and promote its interests, until, by a crowning act of their munificence, it has been furnished with a building in every respect suited to its wants. He urged with great earnestness upon the members the duty of making redoubled efforts in the cause of science. The Address was listened to with great attention by a crowded audience.

At the conclusion of the Address, on motion of B. D. Greene, Esq. it was voted, that the thanks of the Society be presented to Dr. Storer, for his eloquent and interesting Address, and that a copy be requested of him for publication.

Prof. Agassiz asked permission to make a few remarks of a general character, which he thought would not be ill-timed on the present occasion, although it was a meeting for a special purpose. He then made a most earnest and stirring appeal to the students of science in America, to seize the present opportunity to make a greater effort than they had ever made before, to promote the cause of science. Hitherto, he said, we had been obliged to look up to Europe as our leader and guide in this pursuit. American Naturalists had done much, considering the circumstances under which they had labored, but little in comparison with what they could do. The present disturbed condition of political affairs in Europe must, for a time, suspend the progress of science there. It was for us now to make a strenuous, self-sacrificing effort to carry it forward here. A short period of persevering labor on the part of a number of individuals would place America in the position hitherto occupied by the Old World.

June 7, 1848.

The President in the Chair.

Present, fourteen members.

Dr. Gould had recently examined the Shells collected by Mr. J. Bartlett, in the south-western States, for the late Dr. Binney, in reference to his proposed work on the Land Mollusks of the United States, and which Dr. B. had been unable to examine previous to his decease. Dr. G. was pleased to find several new species of much interest, as they tended to illustrate the gradual modification of species in their geographical succession. He gave descriptions of the following:

SUCCINEA LUTEOLA. Testâ variabili, ovato-turritâ, solidiusculâ, laxè striatâ, extus albâ vel corneâ, sed plerumque lutescente, intus luteâ; anfr. 4, supernis rotundatis, ultimo conico-ovato; aperturâ modicâ, ovatâ, partem dimidiam longitudinis vix superante; columellâ normaliter arcuatâ, haud plicatâ, ad regionem umbilicalem reflexiusculâ. Long. $\frac{1}{2}$, lat. $\frac{1}{4}$ poll. *Hab.* Texas.

Very variable in its proportions as well as in coloring. Short specimens resemble S. *campestris* of the South, but want its columellar fold. The elongated specimens are like S. *amphibia;* and in the diminutive size of the aperture it is like S. *vermeta.* Fresh specimens are well characterized by their golden yellow color. It may possibly be Say's S. *undulata.*

Succinea concordialis. Testâ tenui, lucidâ, obliquè ovatâ, acuminatâ, reflexâ, cereâ et ad apicem rubicundâ, leviter striatâ et lineis obscuris volventibus insculptâ; anfr. 3 perobliquis, supernis parvulis, tumidis, suturâ profundâ; aperturâ ovatâ, trientes duæ longitudinis testæ æquante, basi rotundatâ; columellâ arcuatâ, absque plicâ, leviter arrectâ; intus micante. Long $\frac{1}{2}$, lat. $\frac{1}{3}$ poll. *Hab.* near Lake Concordia.

At first view, this might be mistaken for *Limnea columella.* Its color and texture are like S. *amphibia*, from which it differs chiefly in the slight upturning of the edge of the columellar lip, the presence of the obscure revolving lines and the ruddy apex.

Helix selenina. Testâ parvâ, discoideâ, pallidâ, tenuissimâ, exiliter striatâ, diaphanâ; anfr. 5 convexis, ultimo subangulato, suturâ impressâ; basi convexo, umbilico infundibuliformi perforato; aperturâ angustâ, lunari, labro simplici. Diam. $\frac{1}{5}$ poll. *Hab.* Georgia and Florida.

About the size of H. *arborea*, distinguished by its delicacy, its pale, opaline color, its small well-defined and deep umbilicus, its discoidal spire and its narrow aperture. Its color and superior aspect may be compared with H. *lineata.*

Helix rotula. Testâ parvâ, discoideâ, pellucidâ, nitidâ, electrinâ, H. *suppressæ* simili, umbilico infundibuliformi profundo perforatâ; anfr. 6$\frac{1}{2}$, vix convexis, striis distantibus supernè impressis, suturâ marginatâ; aperturâ semilunari, labro simplici, haud incrassato. Diam. $\frac{1}{5}$ poll. *Hab.* Tennessee.

This delicate little species has the size and color of H. *indentata*, and is similarly striated above; the whorls are numerous and closely convoluted like H. *suppressa*, but it has a larger umbilicus, like H. *lasmodon*, and has no thickening or plate within the aperture.

Helix maxillata. Testâ parvâ, globoso-lenticulari, pallidè castaneâ, solidulâ, H. *hirsutæ* simili: aperturâ lineari, labro reflexo, præter emarginationem inconspicuam dente obsoleto divisam integro, fauce lamellam sicut maxillam pone labrum gerente; lamellâ columellari rectâ, supernè bifurcatâ. Diam. $\frac{1}{4}$ poll. *Hab.* Tennessee.

This shell, which is smaller and somewhat more globose than

H. *hirsuta*, is well characterized by its partially bifurcated pillar tooth, and by the peculiar jaw-like plate, almost concealed behind the inflexed lip, within the fauces.

HELIX LEPORINA. Testâ parvâ, lenticulari, lucidâ, rufo-corneâ, pilosiusculâ, leviter striatâ, vix perforatâ ; spirâ depressâ, anfr. 5 convexiusculis, ultimo supernè subangulato ; regione umbilicali excavato; aperturâ lunatâ, labro incumbente, reflexo, roseo, dentes duos albos sinum amplectentes gerente ; lamellâ columellari obliquâ, albâ, erectâ, acutâ, rectangulari, callo lineari supernè ad angulum aperturæ junctâ. Diam. $\frac{1}{5}$, alt. $\frac{1}{8}$ poll. *Hab.* Mississippi and Arkansas.

Intermediate between H. *hirsuta* and H. *inflecta*, though smaller than either. It is less globose than *hirsuta*, while the aperture is much the same, except that the sinus of the lip is formed by the projection of two teeth instead of by an emargination, in this respect resembling H. *inflecta.* From the latter it differs in the columellar tooth. It resembles H. *pustula* still more, but the umbilical region wants the peculiar channel of that species.

HELIX VULTUOSA. Testâ depressâ, utrinque convexiusculâ, tridentatâ, rufo-corneâ, latè umbilicatâ, H. *fallaci* et H. *texasiana* intermediâ ; anfr. 5½ arctè volutatis, convexis, ultimo ad peripheriam sub-angulato ; aperturâ arctè lunari, labro albo, crasso, tortuoso, dentibus duobus instructo, quorum altero mediano profundè posito, retrocedente, altero basali, marginali, falcato ; lamellâ columellari obliquâ, arcuatâ, erectâ, faucem ferè occludente. Diam. $\frac{2}{5}$, alt. $\frac{1}{5}$ poll. *Hab.* Arkansas and Texas.

Differs from H. *fallax* in being generally smaller and more convex, with a narrower aperture more nearly closed by the teeth, and in having the basal tooth much more developed and the median one deeper seated and directed more inward ; from H. *texasiana* it is distinguished by having an open umbilicus, and by having no line of callus connecting the pillar tooth with the upper angle of the aperture, forming a re-entering angle.

Many other Shells are contained in the Collection, which are either new species, or very strongly marked varieties of the northern types. Among them is one, which seems to be quite common from Georgia to Texas, and which Dr. Binney regarded as the southern form of H. *thyroidus*, though some of his specimens were labelled " *clausa* ? " They have the globular form of H. *clausa*, sometimes approaching even to H. *elevata* in height; the aperture is large and rounded, the umbilicus generally quite closed, and the columella sometimes possesses and as often is destitute of a tooth like H. *thyroidus*. I think further observation will establish its claim as a distinct species, and in such case I would propose for it the name of H. BUCCULENTA.

Another form, found in the south-western States, is allied to H. *appressa* and H. *palliata*. It is a little more globular than the former, has its peculiar imperforate base, but its aperture is more open and rounded, and destitute of a tooth. H. *Columbiana* is still more globular, smoother, with an open umbilicus and a peculiar sinuosity of the lip. I would indicate this form by the name of H. ABJECTA.

PUPA VARIOLOSA. Testâ minimâ, ovato-conicâ, rufâ, sub-perforatâ, confertim indentatâ; anfr. 4-5 turgidis; suturâ profundâ; aperturâ obliquè semiovali, dente columellari, altero labiali, altero postico lamellari armatâ: labro vix reflexo. Long. $\frac{1}{12}$ poll. Inhabits Florida.

Smaller than any of our species except P. *milium*, and is distinguished by its short, conical form. The five specimens examined, all presented the crowded thimble-like impressions under a magnifying power of 20 diameters. I think no other American species has the revolving tooth on the penult whorl.

PUPA MODICA. Testâ minutâ, fragili, ovato-conicâ, elongatâ, albâ vel corneâ, edentatâ, anfr. 5 convexis, P. *fallaci* simillima, sed minore dimidio, anfractibus duobus carente; aperturâ campanulatâ, labro expanso, haud planulato. Long. $\frac{1}{10}$, lat. $\frac{1}{15}$ poll. *Hab.* Florida.

Differs from P. *fallax* only in being one half its size, in having two whorls less, and in having a bell-shaped aperture with a thin revolute lip instead of a thick flattened one.

CYLINDRELLA PONTIFICA. Testâ parvâ, ovato-fusiformi, supernè attenuatâ, griseo et fusco marmoratâ; anfr. ad 12 rotundatis, costulis crebris obliquis, alternis suturam prætereuntibus, ornatis, ultimo carinato: apertura laterali, circulari, campanulatâ; columellâ rectâ, umbilicum linearem tegente; peristomate reflexo, ferè continuo.

Allied to *Pupa unicarinata*, Lk., and P. *turrita*, Pfeif., but is smaller, more coarsely ribbed, has a more complete aperture, projecting to the left side, and is readily distinguished from either of them by the projection of the alternate ribs across the suture, giving the whorls a dentate or coronated appearance. Its coloring is like that of *Pupa cinerea.*

CYLINDRELLA JEJUNA. Testâ fusiformi, solidiusculâ, truncatâ, pallidè corneâ, filis tenuibus albis longitudinaliter liratâ: anfr. superstitibus ad 9 (totis ad 18) convexis, ultimo exiliter carinato; suturâ benè impressâ; collo brevissimo; aperturâ expansâ, peritremate albo, continuo, anfractui penultimo haud annexo. Long. $\frac{2}{5}$, lat. $\frac{1}{10}$ poll. *Hab.* Florida.

This may be a form of C. *lactaria*, so common in Florida, and which presents so many varieties, especially in the length of the neck and the development of the lip. But it seems to be constantly smaller, darker colored, more solid, and with more convex whorls. The peritreme also seems never to rest on the penult whorl, as is usually the case in C. *lactaria.*

The President expressed his regret at his necessary absence from the city at the time of the Annual Meeting. He gave an interesting account of his visits to the Collections of objects of Natural History, brought home by the United States Exploring Expedition at Washington, the Collection of the Academy of Natural Sciences at Philadelphia, and the Baltimore Museum. Having made an especial study of the fossil remains of the *Mastodon giganteus,* he was particularly interested in finding at Washington a tooth of an individual of this species, brought from Oregon, the first known to have been received from that locality. In Philadelphia he saw a tooth of *M. angustidens,* probably the identical specimen formerly exhibited in Baltimore as having been found in the Miocene formation of the State of Maryland, not many miles from that city. As it was a solitary remnant of the individual, and as no other trace has been found of the existence of this species in North America, much doubt is thrown upon the fact of its discovery in the alleged locality.

The President's remarks led to a general conversation on the importance of using great caution in fixing the true locality of specimens in scientific collections. Prof. Agassiz laid great stress upon it. He said, the name of the locality should be indelibly inscribed upon every specimen as soon as it is received, even if its scientific name be as yet unknown. By this simple act great confusion and doubt might be sometimes avoided. He said, that he had had for several years in his possession a very interesting fossil fish, *Mallotus villosus*, which he had received without any mention of the locality from which it had been obtained. This fish was of great geological importance, as it was the only instance of a Fossil being identical with a living species. On visiting Dublin several years after it came into his possession, he was shown other specimens of the same fish, and learnt their singular history. They were brought from Iceland, on the shores of which large numbers of them are annually destroyed and converted into this state by volcanic disturbances, by which they are killed and buried in the mud, and become petrifactions. Prof. Agassiz, and Drs. Gould and Cabot, all mentioned instances of specimens of Natural History having been brought from localities where they were said to have been found, but which must have been previously carried there from other localities.

Prof. Agassiz had recently made some observations on the structure of the Foot in the embryo of birds, which he thought would throw new light on the classification of birds, and perhaps call for radical changes in the system now in use. He had examined the feet of the embryo of *Turdus migratorius*, *Hirundo riparia*, *Sylvia æstiva*, and *Fringilla melodia*, and found the following appearances in all.

The four toes, which in the mature bird are separate, three being directed forwards and one backwards, are in this state all directed forwards, and webbed. There is as yet no trace of bone in them, there are only rows of cartilaginous cells in the position to be occupied by bone, which are more closely grouped together at the points where the joints are destined to appear. The lower extremity is, in fact, at this time a fin. The upper extremity is in a similar condition, presenting, however, only three rows of cartilaginous cells, united by a membrane. As this condition of the extremities exists in different families, Prof. A. thinks that the present grouping of all web-footed birds together, may be incorrect; particularly since they differ as much among themselves in other respects as they do from Land birds. He found that the bill of the immature Robin resembled that of a Vulturine bird, being straight near the base, and curved at the extremity, the upper mandible being longer than the lower. This would seem to indicate that the Vulturine form is a lower type than it has usually been considered. This appeared to derive confirmation from the great resemblance of the bill of some of the Water birds to that of some of the Vulturine family, that of the genus *Lestris*, for example. Some of the birds of prey also have another point of resemblance to Water birds in a rudiment of a web between two of the toes. Hereafter, birds having all their toes directed forwards, must be regarded as of a lower type than those which have one directed backwards; as, for instance, the Pelicans and Cormorants among Water birds, and the genus *Cypselus* among Swallows. From the result of his examinations of the embryos of birds, Prof. A. had recently, before a scientific society, ventured to predict that hereafter, among the higher Mammalia, the foot of the embryo would in the same way be found to be webbed, like that of the Seals and Cetacea. Prof. Jeffries Wyman immediately afterward confirmed the truth of the prediction in the case of the fœtus of a Cat. A similar appearance had been figured as existing in the human embryo, but its philosophical bearing had not been before noticed.

Dr. Cabot read a statement of the comparative measurements of the American and European Oyster-catcher. His observations tend to confirm the opinion of the distinctness of the two species, which have sometimes been confounded with each other.

	Hæmatopus palliatus.	*Hæmatopus ostralegus.*
	Female. inches.	Female. inches.
Length from tip of bill to tip of tail	21	$18\frac{1}{4}$
Extent “ “ “ “	36	$32\frac{3}{8}$
Length of tongue	$\frac{6}{8}$	$\frac{7}{8}$
Œsophagus to proventriculus	$7\frac{2}{8}$	7
Proventriculus in length	1	$1\frac{3}{8}$
Intestines to vent*	40	59
Cœca enter intestine at	$2\frac{1}{2}$ from vent.	3
Length of cœca	$2\frac{3}{4}$	$4\frac{1}{8}$
Trachea to bronchi	$4\frac{10}{16}$	$4\frac{1}{16}$
Keel of sternum in depth, not quite	1	1
“ “ in length	$2\frac{1}{2}$	$2\frac{1}{4}$

Prof. Rogers had recently revisited the Anthracite Coal deposites in Rhode Island, and confirmed his previous opinion, that they are of the same geological epoch as the Anthracite Coal-fields in other parts of the United States. In fact, he was satisfied, from the identity of the Fossils in this formation and the adjacent Slate, both in Europe and America, that the age of these deposites must be the same everywhere; and any theory to account for their existence must be “ world-wide.”

Dr. Gould presented several specimens of rocks from Burmah; also, six or eight Shells, among them *Auricula vulpina*, from St. Helena, interesting from the fact that this species has become extinct within a few years.

Dr. Gould read a note from Mrs. Binney, offering as a donation to the Society's Collection a large number of Shells and Fossils from the Southern region of the United States, and of native Fishes beautifully preserved in large jars, which had been collected for her husband, the lamented Dr. Amos Binney, the late President of the Society. On motion of the President, it was voted that the thanks of the Society be presented to Mrs. Binney, for this manifestation of her interest in our welfare; with the assurance that the Society will endeavor to dispose of them for the best interests of science, according to Dr. B.'s well-known desire.

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* A very minute remnant of vitelline duct found at $18\frac{1}{2}$ inches from vent.

Dr. Cabot announced the addition to our Collection of the following Ornithological specimens: *Larus Bonapartii* two specimens, adult male, spring plumage, and adult female, changing from winter to spring plumage; *Hirundo rufa,* male; *Hirundo purpurea,* male; *Tetrao Canadensis,* male and female; *Strepsilus interpres,* adult male, spring plumage; all purchased for the Society. *Calidris arenaria,* male, spring plumage, presented by Mr. Robbins, of Boston market. *Tringa alpina,* male, spring plumage; *Erythrospiza purpurea,* male; *Carduelis pinus,* male, presented by Mr. E. C. Cabot. *Corvus frugilegus,* presented by Mr. E. Cabot. *Hirundo rufa,* female; *Lagopus mutus,* male, winter plumage; *Bonasia sylvestris,* male; *Pica caudata,* male; *Perdix cinerea,* male; all presented by Dr. Cabot. *Ardea exilis; Loxia leucoptera,* male and female adult, and adult male changing plumage; received in exchange.

Dr. Cabot also presented to the Society, in the name of R. B. Forbes, Esq., a complete suite of specimens of the Nutmeg, *Myristica moschata,* in different stages of development. The thanks of the Society were voted to the donor.

A donation was announced from Mr. Horatio R. Storer, of a number of small Fishes, taken by him in the vicinity of the Orkneys and in the Baltic; also several Crustacea, taken from the stomachs of fishes caught on the same voyage. The thanks of the Society were voted to Mr. Storer for his donation.

Dr. John Bacon presented, in the name of Dr. Coale, specimens of *Leucite* and *Olivine* from Mount Vesuvius. The thanks of the Society were voted to Dr. Coale.

A singular specimen was deposited in the Cabinet of the Society by Mr. J. L. Clarke, of a pair of Horns of *Cervus virginianus* deeply imbedded in the trunk of a small oak tree. The block was cut from the trunk at the height of twelve feet. The thanks of the Society were voted to him.

June 21, 1848.

The President in the Chair.

Present, fifteen members.

Mr. Ayres gave an interesting account of some researches he had been making in reference to an obscure point in the anatomy of the genus *Leuciscus.* In the fish of this genus the pharyngeal bones are armed with strong teeth, and by the action of powerful muscles they are brought together, crushing the food before it enters the stomach. For a long time Mr. A. had failed to discover any point of origin for the small muscles, whose function it is to separate these bones after they have been brought in contact. He at last discovered this to be a pair of extremely small, needle-like bones, articulated perpendicularly upon the small bones connecting the branchial arches. The tension upon these delicate bones is sustained by two little ligaments extending from their extremities, on the side opposite to the muscles, to the roof of the mouth, like the backstays of a mast. Mr. Ayres displayed this apparatus in *L. pulchellus.* He presented to the Society specimens of *L. cornutus, L. atrinasus,* and *Fundulus fuscus.*

A portion of a letter from Dr. Mantell to the President of the Society was read, in which he mentioned that he had recently obtained exquisite specimens of the soft parts of *Foraminifera,* preserved in chalk and flint. He had also recently obtained a portion of the lower jaw of the adult *Iguanodon,* with the teeth in place. Referring to the sketch accompanying the letter, he says,

> "You will see, at a glance, that it is wholly unlike the jaw of any reptile, and in truth is not similar to that of any creature, recent or fossil. This relic is the right dentary bone (lower jaw) with the symphysis perfect, two successional teeth in place, and sockets for eighteen mature teeth, not one of which remains.

The extraordinary character is the prolonged and edentulate symphysis, and the great number of vascular foramina on the anterior and external part ; of course indicative of a large, fleshy under lip, and a large, prehensile tongue, both adapted for a large vegetable feeder. You will remember the extraordinary form and structure of the teeth of the *Iguanodon*. The only analogy I can find is in the symphysical portion of the jaw of the Sloth, and particularly in the colossal extinct *Edentata*, the *Mylodons ;* with which other osteological peculiarities of my gigantic reptile correspond ; for example, the vascular dentine of the teeth, and the sacrum formed of five anchylosed vertebræ."

Dr. J. M. Warren presented to the Society a beautiful stuffed specimen of Boa ; also, an admirably mounted skin of a Baboon of doubtful species. Dr. W. stated that this individual had possessed immense strength, having been able to lift a common man from the ground, and cast him from him several feet. Dr. Warren also presented a fine stuffed specimen of an adult male Chimpanzee, four years of age.

Dr. Cabot announced the donation from Russell Sturgis, Esq., of seventy-two valuable East India Bird skins. The thanks of the Society were voted to the donor.

Dr. Gould announced the gift of a number of specimens of Rocks from Malta, from an unknown donor ; also, a donation of several jars containing Reptiles, Fishes, and Birds from Dr. F. W. Cragin, of Surinam. The thanks of the Society were voted to Dr. C. for this renewed evidence of his interest in our welfare.

A valve of *Chama*, weighing over two hundred pounds, was presented by Mr. Benjamin Kent, of Roxbury. The thanks of the Society were voted to him.

A donation of Shells was received from J. J. Dixwell, Esq. a member of the Society ; also, a present of Cocoons of an unknown insect, from Mr. Batchelder, of Saco, through Dr. Storer.

Drs. George Derby and W. W. Morland were elected members of the Society.

ADDITIONS TO THE LIBRARY DURING THE QUARTER ENDING JUNE 30.

Audubon and Bachman. Plates 116–120. Also, 124–130, to their "Quadrupeds of America." *From Subscribers.*

Gelehrte Anzeiger, herausgegeben von Mitgliedern der Akademie der Wissenschaften. Vols. 6–20. 4to. München, 1838–45. *From the Academy at Munich.*

Leidy, Joseph. On a new Fossil Genus and Species of Ruminatoid Pachydermata, Merycoidodon Culbertsonii. 8vo. pam. Philadelphia, 1848. *From the Author.*

George Berkeley. Treatise concerning the Principles of Human Knowledge. Part I. 12mo. Dublin, 1710. *From S. Kneeland, Jr.*

Journal of the Indian Archipelago and Eastern Asia. No. 6, and Supplement to No. 5, for December, 1847. 8vo. Singapore. *From the Editor.*

Annals and Magazine of Natural History. Nos. 1, 2, 3, 4, of Vol. I. 2d Series, June to April. 8vo. London. *Courtis Fund.*

Rennie, James. Ornithological Dictionary of British Birds. By Col. G. Montague. 2d ed. With a plan of Study, and New Articles and Original Observations. By J. Rennie. 8vo. London, 1831. *From Dr. W. Read.*

Elements of Physiophilosophy. By Alonzo Oken. M.D. From the German, by Alfred Tulk. 8vo. London, 1847. *Courtis Fund.*

Memorials of John Ray. Edited by Edwin Lankester, M. D. &c. 8vo. London, 1846. *Courtis Fund.*

Alternations of Generations. By J. J. Sm. Steenstrup. Translated from the German, by George Bush. 8vo. London, 1848. *Courtis Fund.*

Outlines of the Geography of Plants. By F. J. F. Meyen. Translated by Margaret Johnston. 8vo. London, 1846. *Courtis Fund.*

Ray Society. Reports on the Progress of Zoölogy and Botany. 1841–1844. 2 vols. 8vo. Edinburgh, 1845. *Courtis Fund.*

Organization of Trilobites. By Herman Burmeister, M. D. Translated from the German, by Prof. Bell and Prof. E. Forbes. 4to. London, 1846. *Courtis Fund.*

Illustrations of the genus Cinchona. Baron Von Humboldt's Accounts of the Cinchona Forests of South America, and Lambert's Memoir of the different Species of Quinquina. Dissertations of Don Hip. Ruiz on Medicinal Plants of South America. Account of the Spikenard of the Ancients. by A. B. Lambert. 4to. London, 1821. *From Dr. S. Cabot, Jr.*

Alder and Hancock. Nudibranchiate Mollusca of Great Britain. 3 Parts. 4to. 1844–1846. London. *Courtis Fund.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. III. Title page and Index. 8vo. 1848. Also Vol. IV. No. 1. *From the Academy.*

Proceedings of the American Philosophical Society. Vol. IV. No. 39. July to December, 1847. *From the Society.*

Joseph Leidy, M. D. On some bodies in the Boa Constrictor resembling the Pacinian Corpuscles. 8vo. Pamph. *From the Author.*

Silliman's American Journal of Science and Arts. 2d Series. No. 15, for May, 1848. New Haven. *Exchange.*

Reports and Abstracts of the Proceedings of a Committee for the Investigation of the Coal and Mineral Resources of India, to May, 1841. Long 4to. Pamph. Calcutta, 1841. *From J. McLelland.*

Audubon and Bachman. Plates 131–135, of their Viviparous Quadrupeds of North America. *From the Subscribers.*

Recherches Geologiques sur le Jura Salinois. Par M. Jules Marcou. Première partie. 4to. Pamph. Paris, 1846. *From the Author.*

American Almanac for 1831 and 1833. 2 vols. 12mo. Boston. *From Dr. S. Kneeland, Jr.*

Recherches Cliniques et Medicales sur la Créosote. Par E. Miguet. 12mo. Pamph. Paris, 1834. *From the Same.*

Edinburgh New Philosophical Journal, conducted by Prof. Jameson. No. 51, for January, 1838. *From the Same.*

Catalogue des Coléoptères de la Collection de M. le Compte Dejean. 2 vols. 12mo. Pamph. Paris, 1833. *Deposited by Dr. T. W. Harris.*

Report of Lieut. Neil M. Howisen, on the Territory of Oregon. Congressional Documents. 8vo. Pamph. Washington, 1847. *From Hon. R. C. Winthrop.*

Andry's Manual of Diseases of the Heart. Translated by Samuel Kneeland, Jr. 12mo. Boston, 1846. *From the Translator.*

Class Book of Botany. By Alphonso Wood. 8vo. Boston, 1845. *From Dr. A. A. Gould.*

Botanic Essays. By Patrick Blair. 8vo. London, 1720. *From the Same.*

American Annual Register. 1829, 1830. 8vo. Boston. *From F. T. Gray.*

Rordansz, C. W. Europe, Commerce, or Mercantile Guide to the Continent of Europe. 8vo. London, 1818. *From the Same.*

Congressional Documents, &c. 3 vols. 8vo. *From the Same.*

Robertson, William. History of America. 2 vols. 8vo. Philadelphia, 1822. *From the Same.*

Humboldt, Alexander Von. Political Essays on the Kingdom of New Spain. 2 vols. 8vo. New York, 1811. *From the Same.*

Brydone's Tour through Sicily and Malta. 1 vol. 8vo. Dublin, 1774. *From the Same.*

Gerard's Essay on Taste. 8vo. London, 1759. *From the Same.*

McLellan, J. Journal of a Residence in Scotland. 12mo. Boston, 1834. *From the Same.*

Linné, C. General System of Nature. 8vo. London, 1806. *From J. C. Hayden, M. D.*

Manual of Botany for the Northern States. By Members of Botanical Class in Williams College, (Mass.) 12mo. Pamph. Albany, 1814. *From Dr. A. A. Gould.*

Eaton, Amos. Index to the Geology of the Northern States. 12mo. Leicester, (Mass.) 1818. *From the Same.*

Descriptive Catalogue of the Anatomical Museum of the Boston Society for Medical Improvement. By J. B. S. Jackson, M. D. 8vo. Boston, 1847. *From the Society.*

Gray's Genera of Birds. Part XLIV. for June, 1848. London. *Audubon Fund.*

Annals and Magazine of Natural History. No. 6, for June, 1848. *Courtis Fund.*

Genera of the Plants of the United States, illustrated by Figures and Analyses from Nature. By J. Sprague. Superintended, and with Descriptions, by Asa Gray, M. D. Vol. I. 8vo. Boston, 1848. *From Rev. Francis Parkman.*

Dr. Theodore Cantor. Spicilegium Serpentium Indicorum. 8vo. pamph. London, 1839. *From the Author.*

Catalogue of Reptiles inhabiting the Malayan Peninsula and Islands. 8vo. Pamph. Calcutta, 1847. *From the Author.*

Sheet from Proceedings of Entomological Society of London. 1842. (Coleopterous Insects from Chusan and Canton, by Rev. T. Hope.) 8vo. London. *From the Author.*

General Features of Chusan, with Remarks on the Flora and Fauna of that Island. 8vo. Pamph. London, 1842. *From the Same.*

Catalogue of Mammalia inhabiting the Malayan Peninsula and Islands. 8vo. Pamph. *From the Same.*

Proceedings of the American Philosophical Society. Vol. V. No. 40. January to April, 1848. *From the Society.*

Memoires de la Société Phisique et de Histoire Naturelle. Tome XI. 2d Partie. 4to. Genévè, 1848. *From the Society.*

Bulletin de la Société des Sciences Naturelles de Neuchatel. 1844–1846. 8vo. Neuchatel, 1847.

July 5, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, twelve members.

Mr. Desor announced that he had recently been studying with the microscope the development of the ovum of a marine worm of the genus *Nemertes.*

The eggs of this animal, which are of a bottle shape, are laid in long strings, which are nearly of the size of the parent animal. They are attached to the strings by the small extremity, and are generally arranged in pairs. Two or three yolks are usually found in each, and sometimes as many as nine, ten, or eleven, rarely, only one. They are of very soft consistence, and are usually compressed from lying one upon the other. Soon after the eggs are deposited, the division of the yolk commences, but does not proceed so regularly as in some ova. Each division contains a transparent dot. On the twelfth day, each yolk, being provided with cilia, has a revolving motion. This movement has been noticed in so many ova of different classes of animals, that it may be considered as the rule for all embryos. Mr. Desor supposes it to commence as soon as the division of the yolk ceases. It varies in its rapidity, is without any special direction, and never stops. At the fifteenth day, when examined with a high power, the yolk presented the appearance of two zones, the outer of which was furnished with cilia, and was of a lighter color than the inner. On the sixteenth day, with a power of two hundred and fifty diameters, the inner body was seen to be moving within, by means of proper cilia, similar to those of the outer. Some days afterwards this inner body assumed the appearance of an embryo worm. On pressing the envelope it tried to escape from it, and succeeded, moving freely about, and dragging after it the remains of the outer coat. This appendage had no analogy to the placenta or the membranes of other embryos, but was exclusively composed of cells of the original yolk. Mr. Desor remarked upon the extreme singularity of this double and independent motion of the two parts of the ovum. The motion of the inner, he said, seemed to be voluntary, while that of the outer clearly could not be, and resembled greatly that of the spores of Confervæ. The discovery of the existence of these two movements is something new in Embryology. Mr. D. made some remarks, which he said he intended to present hereafter in a more extended form, on the nature of the fluid in which the yolk of the *Nemertes* floats. It exists probably in all ova, but its true nature has hitherto been mistaken by embryologists. He proposes for it the name of the "*Biogen liquid*." In the course of his remarks Mr. D. said that embryologists had laid too great stress on particular days as the epochs of certain stages in the development of ova. These are never precisely uniform in the date of their occurrence, but depend somewhat upon outward circumstances, such as the temperature, for instance.

Prof. Wyman exhibited specimens of various orders of the Ants which inhabit the gigantic Ant-hills of Africa, the

Termites bellicosus. Naturalists have described five orders as belonging to each colony. Of these Prof. W. exhibited four, viz. workers, soldiers, males, and the queen. The body of the last, the parent female, was enormously developed, to accommodate the ova with which it was distended. This great enlargement takes place by an increase of the substance between the scales of the abdominal segments. The royal cell, which was also displayed by Prof. W., is of compact clay, with openings for the free ingress and egress of all the orders except the queen, who is immovably incarcerated in it. There is also a sort of gallery or passage-way surrounding her, with which the external openings communicate. The specimens were brought from Africa by Dr. T. S. Savage.

Prof. Wyman mentioned that he had recently obtained specimens of *Clepsina*, with the young attached to the abdomen of the parent. The mother was observed to sit upon the eggs soon after they were laid. At first these were spherical, but in a few days became elongated. After four or five days they became attached to the mother, and the yolk began to divide in the usual way, and the development of the alimentary canal commenced.

Prof. Wyman also communicated some results obtained by dissections of the nervous system of frogs. He had found attached to the trunk of each of the Spinal Nerves, just before their division into motor and sensitive roots, a vesicle containing a white chalky substance, which under the microscope was shown to be composed of vast numbers of minute crystals, (probably Carbonate of Lime,) each having a hexagonal form, and terminated at either extremity by a six-sided pyramid. The sac containing them was well defined, about half a line in diameter, and subdivided internally by numerous septa into small cavities in which the crystals were lodged. Nervous filaments were traced into the interior of the sac. A deposit of similar crystals was also noticed around the veins in the Spinal Canal, and on the base of the Cranium.

The chalky matter found in the vestibule of the ear he proved by the microscope to be composed of crystals similar in size and appearance to those found attached to the Spinal Nerves. He had sought for them in great numbers of Frogs of different species, and in no instance had he failed to detect them. He had not found them in Menobranchus or in Tortoises, except in the vestibules of the latter. From their constant presence in frogs he was disposed to regard them as essential parts of their Nervous system.

The vesicles have been noticed by Swan in his "Illustrations of the Comparative Anatomy of the Nervous system," but have not been described. Prof. Wyman had been informed by Prof. Owen that he had called attention to them in his lectures at the Royal College of Surgeons, but no detailed description had been given of them.

Mr. Ayres presented specimens of the young of *Leuciscus pulchellus,* exhibiting a characteristic black, lateral stripe. As the fish grows older this mark becomes nearly obliterated. It remains distinct, however, until the end of the first year. It is found in *L. pulchellus*, *L. cornutus,* and *L. atrinasus,* in which last it is permanent.

Mr. A. also presented a specimen of *Pytuophis melanoleucus,* Hoop Snake or Bull Snake, six feet in length, which had been captured on Long Island. This is a very common species in the southern parts of the United States, but has not hitherto been noticed so far north by naturalists. There is a popular notion that this snake takes its tail in its mouth and thus, in the form of a hoop, rolls itself over the surface of the ground. Hence its common name. Mr. A. also presented to the Society a specimen of *Hydrargira multifasciata.*

Dr. Storer presented from Mr. J. T. Plummer, of Richmond, Indiana, the following list of Fishes found in his vicinity, viz., *Ammocetes bicolor*, *Petromyzon argenteus*, *Bodianus flavescens*, *Cichla ænea*, *Gasterosteus inconstans*, *Etheostoma variata, E. caprodes, Catostomus Duquesnii, C. erythurus, C. nigrans, Minnilus dinemus, Luxilus chrysocephalus, L. elongatus, Semotilus cephalis, S. dorsalis, S. diplema, S. biguttatus, Hydrargira limi, Esox reticulatus, Pimelodus cœrulescens, P. cupreus, Hypentelium macropterum.* Dr. Storer also presented a specimen of *Corydalus cornutus,* in the name of E. P. Clark Esq., and a South American insect on behalf of Dr. F. W. Cragin.

Mr. Thomas Bulfinch presented to the Society, a small lobster undergoing the process of changing its shell.

Dr. Francis Minot was elected a member of the Society.

July 19, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, ten members.

Dr. Cabot announced that among the specimens for which the Society is indebted to Dr. Cragin, of Surinam, he had found the male and female of a species of *Chordeiles*, which he was at first disposed to consider as undescribed, but which he finally concluded must be *C. labeculatus*, which has been described from the female, by Jardine. There are, however, some marked differences between our female specimen and his description. The female of our bird measures eight inches, instead of seven and a half, the measurement of Jardine's. On the left wing, at a point opposite the tips of the sixth and seventh primaries, a white band occurs, extending quite across the first three primaries, and becoming rufous on the fourth, and not quite crossing the web on either side of its shaft. On the first primary this band is divided by a black mark along the shaft. On the right wing the band extends across both barbs on the third primary only, there being no white on the outer web of the second, and only a mere trace on the outer web of the first. In all other respects the bird agrees exactly with Jardine's description. Therefore, considering that his specimen had lost the first and second primaries, and that he mentions another specimen which he considered as belonging to the same species, in which he observed some white upon the wings; and considering also the marked difference between the two wings in our specimen, it is fair to conclude that these are merely different stages of plumage in the female of the same bird.

The male is eight and one half inches long; its wing six and five-eighths inches from the flexure. It strongly resembles the female, but has not the rufous markings to the same extent, either on the head or wings. The white band on the wing is purer, and extends entirely across each of the first four primaries. The tail is dark brown, crossed by six or seven greyish bands, and has also a white band, which extends across all but the two middle feathers, at about one half an inch from their tips.

Mr. Forbes, of Windsor, Vt., present by invitation, gave an account of a curious formation, apparently Stalactitic, discovered buried in the sand in a cut for the Central Railroad, at Sharon, Vt. Large masses of a calcareous substance have been found beneath the surface, of a tabular form, a few inches thick. From their under surface depend groups of conical projections, some of them of grotesque shape, others hollow, like some stalactites, and terminating in a point. Occasionally a mass has been found in an inverted position, with the plane surface down, and the points upward. No satisfactory solution of this phenomenon has as yet been given.

Dr. Gould deposited in the Cabinet of the Society, a very fine specimen of *Cerithium giganteum*, from the Paris basin.

A specimen of *Fringilla sanguinolenta* was presented by Dr. J. B. S. Jackson.

Two beautiful specimens of Coral were presented in the name of Miss Champney, of Roxbury. The thanks of the Society were voted for the donation.

Messrs. John A. Henshaw, of Cambridge, John H. Thompson, of New Bedford, and Frederick A. Whitwell, of Boston, were elected members of the Society.

Sept. 6, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, eleven members.

A skeleton of a marine bird was presented in the name of Dr. T. M. Brewer. It was said to have been prepared in the short space of two hours, by exposure to the attacks of a kind of vermin found on the Banks of Newfoundland, which is said to be very destructive to the cod-fish there found. The bird was lowered to the bottom by means of a weighted line, and drawn up in two hours a perfect, ligamentary skeleton.

Mr. Ayres announced that during a recent visit to Long Island, he had obtained a specimen of *Myliobatis acuta,* a rare fish in a locality so far north. It was taken off the south side of the Island. He presented to the Society specimens of *Hydrargira fasciata, Lebias ellipsoides,* and a young *Mustelus canis.*

Dr. Cabot announced that the following birds, belonging to the Society, had been recently mounted and put in the cases; viz., *Pardalotus percussus,* male; *Fringilla* ——, adult and young male; *Regulus calendula,* male; *Coturnix cambaiensis,* female; *Carduelis tristis,* female; *Pitta cyanoptera,* male; *Spermestes* ——, male; *Charadrius melodus,* male; *Lestris Richardsoni,* young; *Cryptonyx coronata,* adult and young male; *Bucco Henricii, Treron olax, Irene puella, Cimbyrhincus macrorhincus, Chara-*

drius pluvialis, Sterna argentea, Rallus virginianus, all males; *Hemipalima multistriata,* young male. Dr. Cabot remarked that the *H. multistriata* is extremely rare in Massachusetts, the specimen which he now presented, with two others purchased at the same time in Boston Market, being the first of the species he had ever seen here. *Porphyrio* ——, male. This bird flew on board of a vessel six hundred miles from land, in the latitude of the Cape de Verd Islands. It lived for several days. It was among the specimens recently given by Mr. Gassett.

Mr. Burnett announced the donation from Dr. T. W. Harris, of between six hundred and seven hundred valuable insects of the order *Coleoptera,* from the interior of Europe.

BOOKS RECEIVED DURING THE QUARTER ENDING SEPTEMBER 30.

Amer. Journal of Science and Arts. 2d series. No. 16. July 1848. *Exchange.*

Report to the Stockholders of the Dauphin and Susquehanna Coal Company. 8vo. Pamph. Phil. 1848. *From T. Bulfinch.*

History of Framingham, 1640 to 1847. By W. Barry. 8vo. Boston, 1847. *From Francis Parkman.*

Annual Report of the Commissioners of Patents, for 1847. 8vo. Washington, 1848. *From R. C. Winthrop.*

Proceedings of the Zoölogical Society of London. No. 161 to 177. July, 1846, to June, 1847. 8vo. Lond. *From the Zoöl. Society.*

Reports of the Council and Auditors of the Zoölogical Society of London. April 1847. 8vo. Pamph. Lond. *From the Zoöl. Society.*

List of the Fellows, &c. of the Zoölogical Society of London. June 1847. 8vo. Pamph. Lond. *From the Society.*

Annals and Magazine of Natural History. No. VII. for July, 1848. *Courtis Fund.*

Ancient Sea-margins, as Memorials of Changes in the Relative Level of the Sea and Land. By Robert Chambers. 8vo. Edinburgh, 1848. *From Gould, Kendall & Lincoln.*

Principles of Zoölogy. By Louis Agassiz and Augustus A. Gould. 12mo. Boston, 1848. *From the Authors.*

Proceedings of the Academy of Nat. Sciences. Vol. III. Nos. 5, 9, 11. 8vo. Pamph. Phil. 1846 – 7. *From the Academy of Nat. Sciences.*

Amer. Journal of Agriculture and Science. For Nov. 1847. 8vo. New York. *From the Editors.*

Audubon and Bachman. Plates 136 to 140, inclusive, of Viviparous Quadrupeds of America. *From Subscribers.*

Descriptions of Plants collected by William Gambel, M. D., in the Rocky Mountains and Upper California. By Thomas Nuttall. 4to. Pamph. Phil. 1848. *From W. Gambel.*

Proceedings of Zoölogical Society. 8vo. Pamph. pp. 123 to 233. Lond. 1847 – 8. *From. J. E. Gray.*

Geographical Memoir upon Upper California, in illustration of his Map of Oregon and California. By John Charles Fremont. Addressed to the Senate of the United States. 8vo. Pamph. Washington, 1848. *From R. C. Winthrop.*

Manual of Mineralogy. By James D. Dana. 12mo. New Haven, 1848. *From the Author.*

Annual Report of the Regents of the University of the State of New York. 8vo. Pamph. Albany, 1848. *From R. C. Beck.*

Proceedings of the American Academy of Arts and Sciences. Vol. I., pp. 297 – 346. 8vo. Boston. 1848. *From the Am. Academy.*

Annals and Magazine of Natural History. 2d series. No. 8, for Aug. 1848. *Courtis Fund.*

Gray's Genera of Birds. Part 45. Lond. 1848. *Audubon Fund.*

Third Annual Report on the Geology of Vermont. By. C. B. Adams. 8vo. Pamph. Burlington Vt., 1847. *From C. B. Adams.*

American Journal of Science and Arts. 2d series. No. 17, for Sept. 1848. *Exchange.*

Addresses on the Dedication of the New Cabinet and Observatory of Amherst College. 8vo. Pamph. Amherst, 1848. *From C. B. Adams.*

Popular Description of the New Cabinet and Astronomical Observatory of Amherst College. 8vo. Amherst, 1848. *From C. B. Adams.*

Geographical Memoir upon Upper California. By J. C. Fremont. 8vo. Pamph. Washington, 1848. *From R. C. Winthrop.*

Traité Elémentaire de Minéralogie. Par T. S. Beudant. 2ème edit. 2 vols. 8vo. Paris, 1830. *From G. B. Emerson.*

System of Theoretical and Practical Chemistry. By. Fred. Accum. 2 vols. 8vo. Phil. 1814. *From G. B. Emerson.*

Lectures on Geology. By Jer. Van Rensselaer. 8vo. New York, 1825. *From G. B. Emerson.*

Treatise on Mineralogy. 2d Part. By C. U. Shepard. 12mo. 2 vols. New Haven, 1835. *From G. B. Emerson.*

Report of the Fifth Meeting of the British Association for the Advancement of Science. 8vo. Lond. 1836. *From G. B. Emerson.*

System of Chemistry. By Thomas Thomson. 8vo. Vols. 2, 3, 4. With Notes by T. Cooper. 8vo. Phil. 1818. *From G. B. Emerson.*

Catalogue of American Minerals, with their Localities. By Samuel Robinson. 8vo. Boston, 1825. *From G. B. Emerson.*

Account of a Geographical and Astronomical Expedition to the Northern Parts of Russia. 4to. Lond. 1802. By Martin Sauer. *From G. B. Emerson.*

Illustrations of the genus Cinchona, &c. By A. B. Lambert. 4to. Lond. 1821. *From G. B. Emerson.*

Bulletin de la Société Geologique de France. Deuxième serie. Tome 5ème, Feuilles 1 – 3. (8 – 22 Novembre 1847.) *From the Société Geol.*

Annals and Mag. of Nat. History. No. IX. 2d series. For Sept. 1848. *Courtis Fund.*

History of the Fossil Fruits and Seeds of the London Clay. By J. I. Bowerbank. 8vo. Pamph. Lond. 1840. *From Joseph Leidy.*

Address at the Anniversary Meeting of the Entomological Society of London. Jan. 1848. 8vo. Pamph. London. *From Joseph Leidy.*

Notice sur la Valeur du Caractère Paléontologique en Geologie. Par L. de Koninck, D. M. 8vo. Pamph. Bruxelles, 1847. *From Joseph Leidy.*

Notice sur quelques Fossiles du Spitzberg. 8vo. Pamph. Par L. de Koninck, M. D. *From Joseph Leidy.*

October 4, 1848.

The President in the Chair.

Present nineteen members.

The business of the meeting was opened by Prof. Agassiz, who announced that during a recent visit to Lake Superior, he had made a special study of its fishes. Among them he had found several new species, and even new genera; and one fish, with a head like a perch, and a second dorsal fin, adipose, concerning which he was in doubt in what family to place it. He proposed, on the present occasion, to confine his remarks to the *Salmonidæ.* Prof. A. then gave a general sketch of the classification of the *Salmonidæ* now in use, and passed on to some observations on some of the Lake Superior species. One of them he believed to be identical with *Salmo fontinalis,* the common Brook Trout of the streams of other parts of the United States.

Salmo amethystus, *Namacush.* Of this species Prof. A. remarked, that the color to which it owes its name does not show itself distinctly while the fish is swimming, or when first caught; but only after being taken from the water, when the mucus on the surface begins to dry. The general color of this species varies with the ground on which it is caught. Those found on a muddy bottom are generally greyish, while those from a gravelly bottom are of a reddish color, with much brighter fins. The sexes differ in shape, the male having a more pointed head than the female, although the jaws are of equal length. The *ventral* fins are placed *very far back;* a valuable specific mark in the *Salmonidæ*, a family in which it is very difficult to fix on characteristic differences. The S. *amethystus* is the most valuable fish for food found in Lake Superior. In answer to a question from Dr. Storer, Prof. A. replied that he did not notice the amethystine color in the mouth of this species.

Salmo siskiwit, Ag. This also is a fish of high flavor, but so fat as to be unfit for food; the greater part of it melting down as it were, in the process of cooking. It is stout, broad and thick; more so than any species of Salmon except the *S. trutta* of Central Europe. The nostrils are nearer the eye than in *S. amethystus*, and the *dorsal* fin is larger. *Tail* much less forked, and of a crescent shape. The color varies according to the feeding ground on which it is caught, and is brighter during the breeding season. The latter fact Prof. A. remarked is true of fishes in general. The young of the *S. siskiwit* have transverse bars which disappear with their growth, like those of other species of salmon.

Prof. A.'s remarks on the color of fishes during the breeding season led to a general conversation on the subject. Mr. Ayres said he considered color a very uncertain mark on which to base specific differences. He had frequently noticed the brighter hue during the breeding season, but so far as his observations extended it existed only in the males. Prof. Agassiz remarked that in the genus *Phoxinus*, the reverse is the case. He agreed with Mr. Ayres, that color cannot be relied on as a specific character. Dr. Bryant remarked that he had noticed at Newport a difference of color in the Tautog, *Tautoga americana*, of different sexes; the females being mottled, and the males of a darker, more uniform hue, with white chins. Mr. Ayres said that he had hardly seen two specimens of this fish alike in color, and the white chin he considered due to the locality. Dr. Storer spoke of the remarkable varieties of color noticeable in the brook trout from different localities; those from waters with sandy bottoms being very bright, while those from waters over muddy bottoms are extremely dark. This difference is even more striking in specimens of pickerel from different places. Mr. Ayres had noticed similar distinctions in trout caught in different parts of the same stream. Prof. Agassiz had observed them in trout frequenting opposite sides of the same brook, according as they were habitually in the sun or shade.

Mr. Burnett read a paper on the Peeping Frog of New England, from which the following are extracts.

"The Peeping Frog has been hitherto considered by Herpetologists as the *Hyla squirella*, and a description and account of it to this effect have been given in the last Report on Massachusetts Reptiles. My friend Dr. D. S. C. H. Smith, of Providence, R. I., lately showed me the true Peeping Frog, which has been vocal until a week since, so that there can be no doubt of the character of the animal. It differs widely from the *H. squirella*." It proves to be the *Hylodes Pickeringii*. Mr Burnett doubted the existence of the *H. squirella* among us. His paper continued: "There is something quite curious in the coloration of this animal, which it possesses in common with others of the same order, consisting in a constant, apparently volitional change of hue. It immediately assumes that of the object on which it rests, be it stone, wood or leaf; and I have noticed it pass in a few minutes, from fright, through all the tints, from a pea-green to the lightest wood color. The habits of this little animal do not differ materially from those of the genus *Hyla*. The peeping sound is produced by both sexes. In summer they cease to be vocal, and retreat from the pools, where the eggs are deposited, to the woods, where they live, hopping about on the boughs of the trees, feeding upon insects, and occasionally making a shrill whistling noise. Having by autumn become quite fat, they leave the woods and pass the winter at the bottom of pools, or in the mud in their vicinity." Mr. Burnett exhibited colored drawings of the animal taken at different seasons.

Dr. Cabot announced that the following ornithological specimens had been recently received by the Society, viz., *Cypselus pelasgius*, Chimney Swallow, presented by Mr. F. Gassett; *Ardea nycticorax*, Night Heron, young, presented by Mr. W. Minot Jr.; *Tringa rufescens*, Buff-breasted Sandpiper, presented by himself. He also presented specimens of gold ore from the Cabarras mine, in the name of Mr. T. G. Cary, Jr.

Specimens of Coal containing vegetable Fossils; Fossil shells from the Catskill mountains, and a *Turritella* were presented in the name of Daniel P. Curtis, Esq. The thanks of the Society were voted for the donation.

Prof. Wyman presented specimens of Fossil fish from Beyroot.

Dr. A. A. Gould presented specimens of *Mallotus villosus* in a fossil state, contained in clay concretions from the coast of Maine. This fish is interesting as being the only species known to naturalists, in both a living and fossil condition.

October 18, 1848.

Mr. E. C. Cabot in the Chair.

Present, ten members.

Dr. Gould presented several specimens of new shells, and read descriptions of them.

Glandina bullata. Testâ papyraceâ, bullatâ, diaphanâ, ellipsoideâ, lacteâ, ferrugineo tinctâ, longitudinaliter crebrò striatâ; spirâ octantem longitudinis æquante, anfr. 5 convexiusculis; suturâ modicâ; aperturâ $\frac{2}{3}$ longitud. testæ, latè lunatâ; columellâ modicè arcuatâ, laminâ callosâ indutâ. Long. $1\frac{1}{2}$, lat. $\frac{4}{5}$ poll. *Hab.* Louisiana.

This shell was received in considerable numbers from Rev. E. R. Beadle, of New Orleans. It differs from *G. truncata* in its extreme tenuity, inflated form, and short spire, in the smaller number of its whorls, its paler color, finer striation, and nearly straight pillar.

Limnea lanceata. Testâ mediocri, fragili, diaphanâ, corneâ, attenuatâ, striis incrementalibus et striis volventibus argutè reticulatâ; spirâ anfr. 6 planiusculis, perobliquis, ultimo $\frac{3}{4}$ testæ æquante; aperturâ angustâ, dimidiam longitudinis ferè adequante, posticè acutâ; plicâ columellari conspicuâ, acutâ, vix spirali; labro fasciâ castaneâ submarginali picto. Long. $\frac{4}{5}$, lat. $\frac{1}{4}$ poll. *Hab.* North shore of Lake Superior, " Pic Lake," where it was collected by Prof. Agassiz.

Next to *L. gracilis* this is the most delicate species we have. It may be compared with *L. attenuata* and *L. reflexà*, from both of which it differs in the flatness of its whorls, in its aperture, which is proportionally much longer and narrower, and in being only about half their size. It is much like large specimens of *Physa hypnorum* reversed.

Prof. Agassiz read a paper on the necessity of a thorough revision of the system of classification in Zoölogy now in use. He gave a sketch of Cuvier's system, and showed its many deficiencies in the present advanced stage of science. He thought that a more perfect system was called for, based upon the embryonic development of animals, and the order of their appearance at the various geological epochs. His views were illustrated by many interesting facts. Dr. Gould followed with some interesting observations in confirmation of Prof. A's. views, drawn from his study of the Mollusca. He had noticed among them a structural agreement, according to their position in the scale, with the order of geological succession. Points to which he alluded in illustration were the degree of development of parts, as that of the head, for instance; the development of distinct organs, as of the eyes; and the shape of the shell.

Mr. Desor gave an account of his recent zoölogical investigations among the shoals of Nantucket, whilst on board the surveying steamer Bibb; Capt. Davis having afforded him every opportunity for dredging in depths varying from three to twenty-five fathoms.

Among the radiated animals which thus came under his examination were the following:

HYDROIDIAN POLYPS.

1. Plumaria arborea, Desor. Polypidom arbuscular, irregularly branched; branches long and pinnate, the pinnæ leaning to one side. Cells pyriform, with a plain margin, very close together, on the internal side of the branches. From 4 to 6 inches high. Dredged on the Shoals of Nantucket, ten miles east of Sancati Head, from a depth of fourteen fathoms.

2. Sertularia filicula, Ellis. From 2 to 3 inches high.

Found in great quantity on Nantucket Shoals, adhering to stones and shells, at depths varying from six to twenty-four fathoms.

3. SERTULARIA ARGENTEA, Ellis. Varies in size from 3 and 4 inches to 1 foot and a half. Common at depths of from three to five fathoms; also found frequently on the beaches around Cape Cod, where it is thrown by the waves.

4. SERTULARIA PLUMEA, Desor. Polypidom very fine, like down; stem very little branched. Cells opposite, very close. Differs from S. *rosacea*, Johnst., in being much less branched. Height 1 inch. Dredged from twenty-two fathoms near South Shoal.

5. LAOMEDEA DICHOTOMA, Lin. From half an inch to an inch high. Attached to stones and shells. Found at a depth varying from ten to fifteen fathoms, near South Shoal.

ASCIDOIDIAN POLYPS OR BRYOZOA.

6. FLUSTRA TRUNCATA, Lin. Very abundant near South Shoal, at depths varying from fifteen to twenty-two fathoms.

7. CELLULARIA TURRITA, Desor. Polypidom dense, like a bush; stem orange colored, divided into a great number of branches, so that each stem looks like a small tower or pyramid. Found in depths varying from three to fifteen fathoms. Thrown in great quantity on the beaches of the islands of Nantucket and Martha's Vineyard.

8. CELLULARIA DENSA, Desor. Polypidom very dense, bushy: divided into a great many branches, which are brittle when dry. Somewhat allied to C. *avicularia*, Pallas, but differs in the form of the cells, which are more simple. Dredged from a depth of twenty-two fathoms near the South Shoal.

9. LEPRALIA VARIOLOSA, Johnst. Very abundant on the Shoals of Nantucket, at depths of from ten to twenty-five fathoms, where it covers almost every stone and shell. Its color is of a bright red, but it fades very soon after being brought to the surface.

10. MEMBRANIPORA TENUIS, Desor. Cells lobate, more elongated than in M. *pilosa*, Pallas, with a plain margin of a pale pink

color. Abundant in Muskeget Channel at a depth of from three to five fathoms.

ECHINODERMS.

11. Asteracanthion forbesi, Desor. Rays about two and a half times as long as the disk is broad. Differs from A. *rubens* in its more cylindrical rays, and in its spines, which are not pointed, but obtuse and canaliculate along the avenues. Color reddish brown. Dredged from a depth of eight fathoms in the Vineyard Sound.

12. Asteracanthion rubens, Müll. Found at all depths, from low water mark to twenty-five fathoms.

13. Asterias spongiosa, Fabr. Frequent among barnacles, at depths of from five to fifteen fathoms.

14. Ophiocoma aculeata, Müll. Frequent among barnacles, at the same depth as the preceding species, and commonly associated with it.

15. Echinarachnius parma, Rumph. Found in great quantity among the Shoals of Nantucket, at an average depth of from six to twenty fathoms. Of a bright red color, but turns green after death. E. *atlanticus*, Gray, is nothing but a young individual of this species.

16. Echinus granulatus, Say. Found scattered at all depths from low water mark to twenty-five fathoms. Of a beautiful green color at the greatest depths.

17. Sipunculus bernhardus, Forbes. Frequent in the Vineyard Sound, at the depth of from six to twelve fathoms. Found generally in the shells of *Buccinum trivittatum*, Say, which are very common in this locality, at that depth.

18. Cucumaria fusiformis, Forbes. But one specimen was found, white, tinted with pink on the back. It was dredged near South Shoal, from a depth of twenty-two fathoms.

Mr. Desor described also two new species of Sponges.

19. Spongia urceolata, Desor. Cup-shaped, with a lobated margin ; perforations very minute. Diameter 1 inch. It is of a

bright red color, but turns black after death. Dredged in the harbor of Edgartown, from a depth of four fathoms.

20. Spongia sulphurea, Desor. A large species, massive, variously crooked and bent, often annular. Surface covered with many scar-like impressions, at the bottom of which are seen small perforations. It is of a bright yellow color when alive, like sulphur, but turns black after death. Found in great abundance in the Vineyard Sound at a depth of from six to ten fathoms, attached to stones or old shells.

Among the twenty species here enumerated, nine only are mentioned in Gould's Report on the Invertebrata of Massachusetts, seven are entirely new, and four have not been found before on this side of the ocean. Most of the species seem to be exclusive inhabitants of the deep waters, with the exception of the two very common species of Echinoderms, (*Echinus granulatus* and *Asterias rubens*,) which are found at all depths.

Mr. Desor offered for the acceptance of the Society, the original specimens of the above-described species.

Mr. Burnett read a long and interesting paper on the "Hibernation of Insects, and its relation to their Metamorphoses." After some preliminary remarks on the relations of the functions of animal organisms to the season of the year, and the laws regulating the phenomena of hibernation, he came to the consideration of these laws as particularly manifested in the economy of insects. In the course of his observations this autumn upon the *Noctuidæ*, he had noticed that the ova of one species, *Clisiocampa americana*, the common Tent Caterpillar, instead of remaining all winter, as has been supposed, exposed to the cold and storms in an undeveloped state, begin at once to undergo the embryonic changes. He found in every egg which he opened, a young caterpillar with the vitelline sac attached to it, the vitelline duct entering upon the back. He had observed the same thing in several other species of *Noctuidæ,* and therefore infers its probable existence in all. He exhibited to the Society specimens under the microscope, displaying these appearances.

Mr. Burnett remarked of those species which hibernate under ground, that he had found that they undergo at once the transition from the Pupa state to that of perfect insects, as occurs in the diurnal *Lepidoptera.* He said he thought that a kind of alternation of generation, as it is explained by Sars and Steenstrup, was noticeable in insects. He illustrated his point by a very interesting account of *Bombus americanus*, the American Humble-Bee. His paper concluded with some observations on the distinction between the hibernation of animals, and the Pupa condition of insects. (For the paper in full, see Journal of the Boston Society of Nat. History, Vol. VI. No. 1.)

Mr. Ayres read a paper on a very curious fish which he exhibited to the Society. It was taken at sea, south of the Grand Banks of Newfoundland, in 42° N. lat. and 50° W. long., by Capt. Porter, of St. Stephens, New Brunswick, and is now in the possession of Miss L. Felt, of Boston. When taken it was in a vertical position, with the snout a little above the surface of the water. It was living, but made no attempt to escape. It somewhat resembles the genus *Scopelus*, but differs from it in so many particulars as to make a new genus necessary to receive it. From a striking peculiarity, the softness of its bones, Mr. Ayres proposes for the genus the name of *Malacosteus*, and for the species, from its color, *Malacosteus niger.*

Some of its most striking features are the large size of the eye, the great development of the facial and branchial apparatus, making the head appear to be one quarter of the length of the whole body, while the cranium in reality is remarkably small; the immense gape of the mouth and gills, which is greater than in any other known species; the long sharp teeth in the lower jaw; the small fins, indicating slowness of progression; the absence of scales or any traces of their development; the existence of a singular spot on the cheek, a short distance below the eye, resembling very much the lens of that organ; the extreme softness of the bones, which can be pierced even in their hardest parts by a needle, with the greatest ease; the absence of branchial rays; and the existence of only a trace of humeral bones. Length 8¼ inches.

From an imperfect dissection, all that he was permitted to make, Mr. Ayres had ascertained a few particulars with regard to its anatomy.

The ovaries present a striking peculiarity in their want of symmetry. They are dissimilar in form, size and situation; a character unknown in any other genus.

The apparently single bone proceeding from the cranium to the articulation of the lower jaw, is found to consist of the temporal, tympanal, and jugal bones united. Of the other bones of the cheek no ossification can be found. The organ on the cheek resembling the lens of the eye, is found under the microscope to be composed of muscular fibres, and is probably part of the *masseter*. (For the paper in full see Journal of the Boston Society of Natural History, Vol. VI. No. 1.)

Dr. Storer had recently received from Capt. Atwood, of Provincetown, a beautiful specimen of *Zygœna*, Hammer-head Shark. The *Zygœna* of our waters has been hitherto considered by naturalists the *Z. malleus*. Dr. Storer had never before seen a perfect specimen. From an examination of the specimen from Provincetown he was now enabled to say that the species is not the *malleus*, but a new one, to which he proposes to give the name *Z. subarcuata*. Dr. Storer exhibited a fine drawing of the fish, and read the following account of it.

"When my 'Report on the Fishes of Massachusetts' was published, in 1837, I had not seen a specimen of a *Zygœna* belonging to our waters. Two years afterwards, I received a dried one, which was taken at Chatham, on the south side of Cape Cod. Imperfect as it was, I described it in a *supplement* to my report, which appeared in the fourth volume of our Society's

Journal; and agreeing as it did, in some important particulars, with the *malleus*, as described by Valenciennes in the 'Memoires du Museum d' Histoire Naturelle,' which latter species is said by this writer to be found upon the coast of Brazil, I concluded it must be that species.

DeKay in his Report on the Fishes of New York, after having seen several specimens, arranges it also as the *malleus.*

A recent specimen, brought me by my old friend Capt. Atwood, from Provincetown, where it was taken a few weeks since, enables me to determine the species — to settle the question that it is not the *malleus*, but an undescribed species, which I would thus characterize.

Zygœna subarcuata. — Head, broad again as long; anterior portion of head convex; posterior margin of head concave. Distance from snout to first dorsal fin equal to one fourth the length of the fish.

The *malleus* is described as having the head three times as broad as long; the distance between the snout and the first dorsal fin equal to one third the entire length of the fish; the anterior portion of the head slightly scalloped, and its posterior margin nearly straight.

The specimen above described is two feet long, and is the third of this species I have known to be taken north of Cape Cod, — all of which have been caught in the harbor of Provincetown, in nets set for mackerel.

DeKay speaks of a specimen having been taken *eleven feet* in length. He says the species is 'much dreaded for its boldness and ferocity;' and Mitchill tells us of a specimen in whose stomach was found 'many detached parts of a man, together with his clothing.'"

Dr. Storer also read a paper on a new species of *Carcharias,* as follows:

"Two or three months since, I read a description and presented a figure of a species of shark, measuring nearly thirteen feet in length, and supposed to weigh about 1500 pounds, which was captured at Provincetown in June last. Thinking this enormous species must have been described by some previous Ichthyologist, I was unwilling to hazard a description until I had further investigated the subject. Now, not having been able to find a description which answers to it, I feel compelled to consider it as a new species, and would offer the following characters.

CARCHARIAS ATWOODI. Above, of a leaden gray color, white beneath. Body very short anterior to the ventral fins. Pectorals large. Anal back of second dorsal. Teeth in both jaws, large, triangular, serrated ; those of the lower jaw, the smaller. About twenty-four teeth in each row.

I know of no species which can be thought of, while examining this species, unless it be the *C. vulgaris,* the great White Shark. In that species however, the *anal fin is opposite the second dorsal*, and the *upper lobe of the caudal fin has no triangular termination.*

The absurd notion of indiscriminately annexing the names of individuals to objects of Natural History has been almost discarded, unless in cases where the persons so specified have in some way advanced the boundaries of science. In the instance before us, I feel you will all agree with me in acknowledging that the compliment here offered, is deserved ; when I remind you that the hardy fisherman referred to, while constantly engaged in the fatigues of his exceedingly laborious profession, has transmitted me within the last two seasons, besides the species here described, a species of *Blennius*, and *Motella*, both of which *genera* were new to our waters ; besides a specimen of the *Somniosus brevipinna*, previously only known by a description of a stuffed specimen met with by Lesueur, at Marblehead, thirty years ago; and a specimen of *Aspidophorus monopterygius*, never but once previously met with south of Greenland; without referring to numerous specimens of our most common species. I would at the same time reiterate, what you have repeatedly heard me state, that he is more conversant with the history and habits of the Fishes north of Cape Cod, than any individual with whom I am acquainted ; or in other words, that he is our best practical Icthyologist."

Dr. Gould presented, in behalf of Mr. B. S. Porter, the skin of an African bird which is frequently transported to South America, where it is kept for a cage bird. In South America it is called La Viuda or Widow Bird. The donation was accompanied by a letter giving an account of some of its habits and changes of plumage.

Mr. Henry W. Abbot was elected a member of the Society.

November 1, 1848.

The President in the Chair.

Present, nineteen members.

Dr. Gould now gave descriptions of the following shells from the Collection of the Exploring Expedition.

NATICA ALGIDA. Testa parva, tenuis, globosa, glabra, albido-livescens : spira anfr. 4 ventricosis juxta suturam linearem tabulatis, ultimo magno ampullaceo: apertura semilunaris; columellâ arcuatâ : basis umbilico modico spirali funiculato, ad aditum angulato, perforata. Long. $\frac{5}{8}$; lat. $\frac{3}{5}$ poll. *Hab.* Rio Negro.

Differs from N. *soluta* principally in its sutural region, and in its umbilical region, in which latter respect it differs from several allied species such as N. *globosa*, N. *borealis*, &c.

NATICA DILECTA. Testa parva, globulosa, solida, sub epidermide sordidâ eburnea, lineolis rubiginosis araneosis scutulata et propè suturam lituris castaneis maculata ; spira rotundata, anfr. 5 ventricosis : apertura semilunaris ; labro crasso ; columellâ valdè calliferâ, callo anticè et ad funiculum castaneo, et canali transverso ferè diviso ; umbilico amplo, funiculo ferè impleto. Long. $\frac{5}{8}$; lat. $\frac{5}{8}$ poll. *Hab.* —— ?

Has a general resemblance in size and form to N. *maroccana*, and must also be allied to N. *lupinus*, Desh. The whorls are closely appressed at the suture, and the network coloring is much like that on the bands of *Conus ammiralis*.

STOMATELLA DECOLORATA. Testa auriformis, depressa, subperforata, albida maculis lacteis et labeculis sanguineis marmor-

ata, costulis numerosis confertis cincta, striis minutis ad paginam superiorem interpositis : spira prominula, anfr. 4 planulatis, suturâ profundâ discretis : apertura obliqua, sub-circularis ; columellâ acutâ, supernè reflexiusculâ, areolâ latâ inornatâ adjacente. Long. $\frac{7}{8}$; lat. $\frac{5}{8}$; alt. $\frac{3}{8}$ poll. *Hab.* Mangsi Island.

Allied to S. *maculata*, Quoy., but the spire is less elevated, the aperture is more rounded, and above all it is characterized by the plain white lunate area adjacent to the columella.

Stomatella tumida. Testa subglobosa, ampullacea, tenuis, nitida, cinereo-olivacea, propè suturam albido et rufo seriatim maculata et lineolis sagittatis vittata, subtus flavescens, sulcis remotis cincta, sulcis basalibus fusco-articulatis ; spira anfr. 4 tumidis : apertura circularis ; labro acuto, albo ; columellâ revolutâ, callo copioso, erecto, albo-striato marginatâ ; intus margaritacea. Long. $1\frac{1}{8}$; lat. $\frac{3}{4}$; alt. $\frac{7}{8}$ poll. *Hab.* China Seas, Moluccas.

Distinguished by its globular form, shining surface, peculiar coffee-colored ground with delicately painted feathery ridges and the large white erect columellar callus. It accords with the figure in Chemnitz, named *Turbo papyracea*, but that shell is described as perfectly smooth.

Ampullaria columellaris. Testa ponderosa, imperforata, rhomboidali-ovalis, nitida, sed sub lente argutè reticulata, flavo-viridis, fasciis rubidis cincta : spira elevata, anfr. 7 ventricosis : apertura semilunaris $\frac{2}{3}$ longitud. testæ adæquans ; columellâ axillari, prælongâ, cylindricâ, contortâ ; labro flavido, evaso ; fauce castaneo. Long. $2\frac{1}{2}$; lat. 2 poll. *Hab.* Province of Maynas, Peru.

Remarkable for its solidity, its elongated form, its want of umbilicus, and the presence of a columella like that of the bulimoid helices.

Amnicola badia. Testa minuta, elongata, ovato-turrita, badia : spira acuta, apice erosâ, anfr. 5 convexiusculis, ultimo vix angulato ; suturâ impressâ : apertura ovata, peristomate continuo, obtuso, fusco. Long. $\frac{1}{5}$; lat. $\frac{1}{12}$ poll. *Hab.* Banks' Peninsula, N. Zealand.

A small elongated species like A. *preissii* of New Holland.

Its color and its dark obtuse peristome give rather marked characters to a shell so small and simple.

AMNICOLA EGENA. Testa minuta, tenuis, sub-perforata, elongato-turrita, epidermide virescente induta: spira acuta, anfr. 5 convexis; suturâ profundâ: apertura ovata; peristomate continuo, labro acuto, patente. Long. $\frac{1}{5}$; lat. $\frac{1}{10}$ poll. *Hab.* Banks' Peninsula, N. Zealand.

More slender and less solid than A. *badia,* and of an entirely different color. It is very much like *Paludina acuta* of Europe.

LACUNA CARINATA. Testa parva, tenuis, ovato-globosa, epidermide corneâ tenui undulatim striatâ induta: spira anfr. 5 ventricosis, ultimo carinâ filosâ cincto: apertura semicircularis dimidiam testæ adæquans; columellâ rotundatâ. Long. $\frac{3}{10}$; lat. $\frac{1}{5}$ poll. *Hab.* Puget Sound.

In color and marking much like L. *vincta* of our shores. Our shell sometimes has the last whorl perceptibly angular, but it never has the filiform carina.

LITIOPA DECUSSATA. Testa parvula, perfragilis, acuto-conica, badia; spira anfr. 8 convexis, transversim striatis, apicalibus plicatis: apertura ovata anticè subtruncata; labro simplici; columellâ arcuatâ, antice unidentatâ. Long. $\frac{3}{40}$; lat. $\frac{1}{40}$ poll. Found on floating wood, lat. 37° 40′ N., long. 54° 30′ W.

Agrees well with L. *striata*, Pfeiff., except that it is less than half the size.

Mr. Desor exhibited specimens and gave an account of a new species of *Salpa* obtained by him off the coast of Nantucket.

This genus is interesting as furnishing an instance of alternation of generation; one generation consisting of many individuals united together in a common chain, the next of separate individuals, and so on in alternate succession, each kind producing the other. Mr. Desor gives to his new species the name *Salpa Caboti.* The genus Salpa had been doubtfully classed, he stated, among the Mollusks. It differs from them in the following particulars. The intestine is reflected, and opens at the common orifice of the body. The circulation (which is not a true circulation, but a simple oscillation of the fluids from one side to the other, first in one direction and then back again,) is regulated by a valve which is not found in the Mollusks, and acts in either direction, according to the motion of the current. Locomotion is produced by the contraction of strong muscular bands, whereas in the Mollusks it is generally produced by the alternate contraction of many small muscles. In the Salpa it is difficult to say which is the anterior and which the posterior extremity. On the other hand it resembles the Medusæ, especially the Beröe, in its transparency; in the character of its tissue, which is furnished with similar projecting points; in its stinging power when held in large quantities in the hand; and in the position of the embryos around the stomach. The Salpa propels itself by taking in water and expelling it again with force by openings, which in the separate individuals are two in number, in the complex chain one for each member. In reply to a question from Dr. Gould, Mr. Desor said that so far as he had been able to examine it the nervous system is ganglionic, like that of the Mollusks.

Mr. Desor also exhibited some drawings of a new species of *Pelagia* obtained by him in Nantucket Bay. This genus has not before been found on this side of the Atlantic; and the species, characterized by having eight eyes, and five long slender threads, he proposes to call P. *quinquecirrha*.

Dr. C. T. Jackson exhibited specimens of a new mineral found in the copper deposit of the Pittsburg and Boston Company's mine at Lake Superior. He had not yet completed its analysis, but it belonged, he said, to the family of the Zeolites. He also exhibited rings ingeniously made of native copper and silver, the two minerals remaining in contact just as they occur in the mine. He gave an interesting account of the mining processes carried on at Lake Superior. He stated that the sandstone of that region agrees in its characters with those of the oldest of the sandstone formations. He concluded with an account of the immense quantities of Specular Iron ore found in the region south of L'Anse, Lake Superior, on or near the Machigamig river.

Dr. Storer presented a specimen of *Cottus*, taken in eighteen fathoms of water on Nantucket Shoals. It was only one inch in length, and proved to be the *C. variabilis* of Ayres, which is improperly described by DeKay as the *C. æneus* of Mitchill. The true *C. æneus* is another species. The *C. variabilis* is usually found in shoal water along the shores; and it is a curious fact that the specimen presented should have been taken in such deep water. Three were caught by Mr. Desor, of which the specimen presented was one, in water of twelve, fifteen and eighteen fathoms depth.

Dr. Storer also presented, in the name of Dr. Forsyth of Chelsea, Mass., a specimen of *Chimæra Colliei,* from California, described and figured in the Zoölogy of Beechey's Voyage. This genus of fishes is remarkable for having on the top of the head a large projecting mass, covered with spines, which shuts down over it like a hood, and serves as a protection.

Dr. Bacon presented, in Mr. Alger's and his own name, a number of mineralogical specimens, most of which had been recently collected during a mineralogical excursion to the western part of New Jersey.

Dr. David S. C. H. Smith of Providence R. I., was elected a Corresponding Member.

November 18, 1848.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, twenty-four members.

Mr. J. D. Whitney exhibited and described a large reflecting goniometer, made by August Oertling, in Berlin. This instrument is in its general form and arrangement similar to that described by Mitscherlich, in the Transactions of the Berlin Academy; it has, however, several improvements over any other instrument which has been as yet constructed. The execution of the work is highly creditable to the maker, who is well known as one of the most skilful and ingenious workmen in Germany.

By a slight change in the arrangement of some of the parts, this instrument may be used for the determination of indices of refraction, and for other purposes in physical research, when nice angular measurements are required. The graduation is on silver, and reads by two verniers to 10″.

Mr. Whitney read a paper containing the results of the chemical examination of certain American minerals. The mineral named by Nuttall, Nemalite, and since analyzed by Thomson and Connell, with very discordant results, is simply a fibrous hydrate of magnesia, as was supposed by Nuttall himself without analysis. The name Nemalite ought not to be continued, since the substance differs only from Brucite, or hydrate of magnesia, by being in a fibrous state. Mr. Whitney read a description and analysis of a mineral from the north shore of Lake Superior, which had been hastily and incorrectly examined by Mr. Le Conte, and named by him, Coracite. This mineral contains the oxide of uranium, $\dddot{\bar{\mathrm{U}}}$, combined with oxide of lead and lime, also, carbonic acid, water, silica, alumina and oxide of iron. It differs from pitchblende in its ready solubility in acids; the uranium existing in pitchblende as $\dot{\mathrm{U}}\,\dddot{\bar{\mathrm{U}}}$, the proto-peroxide, and of course in an insoluble state. He also read analyses of Pectolite from Isle Royale and Bergen Hill, and showed that the Stellite of Beck from Bergen Hill, as well as the Stellite and Wollastonite of Thomson, ought to be united with Pectolite, since they agreed with it entirely in chemical and physical characters.

Mr. Desor exhibited a number of Drift fossils from Nantucket, which he had collected in company with Mr. E. C. Cabot. They were taken from the cliff at the east end of the island. The outlines of the strata on the surface of this cliff are somewhat obscured by the sand which has been blown over it. About half way up it is an oyster bed, from which the specimens were taken. It contains many fossils in a remarkably perfect condition; even crab's claws being found here unbroken. Its position indicates that it has not been disturbed since it was formed. It contains most of the species found on the neighboring beaches. Specimens of Venus are sometimes found with the valves open, as if from the relaxation of the muscles at the moment of death.

Until within two years it has been supposed that there were no fossils in the drift south of Lake Champlain. Last year Mr. Desor discovered a similar fossil deposit on Long Island in Brooklyn, which was then carefully examined by himself and Mr. Redfield. Its origin was very doubtful however, as the shells were very much broken and worn. But at Nantucket, a point between these localities, the formation is now found to exist without the least trace of disturbance. The strata at the east end of this island dip towards the west, the angle of dip gradually increasing from the highest to the lowest. The fossils are of the same species as those now living on the neighboring shore; an interesting fact indicating a similarity of climate at the time they were deposited with that of the present. In Europe the opinion has prevailed among geologists that at the epoch of the drift the climate was colder than it is now.

Beneath the oyster bank of Nantucket is a stratum of coarse, sandy clay, very much like that at the base of the cliff of Gay Head, which was regarded by Prof. Hitchcock as a tertiary deposit. It is probable, therefore, that these two formations are the outcrops of a Tertiary basin which passes underneath these two islands of Nantucket and Martha's Vineyard and the intervening sea.

Boulders are found on the surface of both of these islands. It is an interesting inquiry how those on Nantucket could have been deposited above the bed of fossils without disturbing it. The regularity of the stratum of sand under them, and the character of the climate as indicated by the shells, are incompatible with an explanation based on the glacial theory. They could hardly have been brought by Icebergs, for among them are masses of Pudding-stone, such as exists at Hingham and Roxbury, which rest here at a higher level than their source.

Prof. Agassiz gave an account of two new fishes obtained by him at Lake Superior, which he regarded as the types of two new genera. The first is an entirely new type in the class of fishes. Prof. A. incidentally alluded to his former researches, by which he had demonstrated the constant relation existing between the character of the scales and the general character of the fish, and mentioned some instances in illustration.

The first of these two new species is a small fish, five or six inches long, in its general shape resembling a *Leuciscus*. It has the adipose fin of the *Salmonidæ*, but not the jaws of that family; these strongly resembling those of the *Percoids*. In its scales, which are serrated on their margins, it also resembles the *Percoids*. Its characters are sufficiently peculiar to justify the establishment of a new family from this single species. Fossil species with similar characters are found in the cretaceous formations. This is the second, Prof. A. remarked, of the "old-fashioned" fishes, so to speak, corresponding in their structure to fossil species, which has been observed in this country. The other, the *Lepisosteus*, is the only living representative of a large family of fossil species. The existence of these two species has undoubtedly reference to the fact, that America is the oldest extensive continent which has been upheaved above the level of the sea. In New Holland, two genera exist, bearing similar relations to older families; a fish, the *Cestracion*, or Port Jackson Shark, and a shell, the *Trigonia*, which have their analogues among the oölitic deposits. Prof. A. exhibited a colored drawing of the new fish of which he was speaking, by Mr. J. E. Cabot; and presented specimens for the cabinet of the Society. He has given it the name "*Percopsis*," on account of its resemblance to the Percoids.

The second species, to which Prof. A. gives the name *Rhinichthys*, is characterized by its long snout, the position of the mouth beneath it, and the arrangement of the teeth. The male is brighter than the female.

This genus belongs to the family of *Cyprinidœ*, and should be placed in the vicinity of *Barbus*, though it has no barbels. *Leuciscus nasutus* of Ayres, and L. *atronasus* of Mitchill, belong to this genus.

Prof. Agassiz also exhibited a colored drawing of *Sphargis coriacea*, Leather Tortoise, which was recently cast on shore at South Wellfleet, Cape Cod. It is the second only of this species which has been obtained from our waters.

Dr. Cabot stated that during a recent visit to the east end of Long Island, he had made some interesting observations on the formation of fresh water ponds by the closing up of the entrances to inlets from the sea. About three miles from the end of Montauk Point is such a pond, from four to six miles in circumference, separated from the sea by a sand beach about twenty rods wide. Within the memory of persons now living it was an open strait, by which small vessels passed through the island. Its waters are now entirely fresh, and contain fresh water animals, such as *Emys picta*, E. *punctata*, and *Emysaurus serpentina;* and fresh water plants, among which is the *Valisneria.* It is the resort of myriads of water fowl, such as are usually found on fresh water. To a great distance from the shore this pond is very shallow, but becomes deeper towards the centre in the probable situation of the old channel. Within twenty years, oysters could be obtained here, and their shells are still abundant. In the vicinity of this pond are smaller ones of a similar character. In other places the process of transformation may be seen now going on. The sea washes up a sand bar across a bay, and in time stops up its entrance. Sometimes this obstruction is broken through by storms, and the sea again enters until the passage is once more closed. Sometimes the barrier is removed by the neighboring inhabitants, to permit the entrance of the herrings. It is an interesting question how the water in these ponds becomes changed from salt to fresh.

Mr. Desor mentioned several similar facts in confirmation of Dr. Cabot's statements.

Mr. Ayres said that he was very familiar with the region which was the subject of Dr. Cabot's observations. He stated, that in the pond to which he had particularly referred, there are still to be found specimens of the Striped Bass, *Labrax lineatus,* which had been shut in when it was cut off from the sea.

Mr. Whitney suggested as an explanation of the change from salt to fresh water in these ponds, that, as the bottom is sandy, all the water originally enclosed had escaped by percolation, and its place has been gradually supplied by rains and neighboring springs.

Mr. Ayres stated that in the neighborhood of these ponds there exist, on the sea-shore, the remains of a pine forest, which has been submerged. At low tide, a strip of this

forest, consisting of numerous stumps with their roots, from which a large part of the soil has been washed away, is left dry upon the beach; down which it extends below low water mark to an unknown distance.

Dr. Gould read descriptions of the following new species of shells, brought home by the U. S. Exploring Expedition:

Littorina patula. Testa magna, solida, rudis, rotundato-ovata, cinereo-olivacea albido maculata: spira anfr. 5, ultimo magno, ventricoso; suturâ vix impressâ: apertura ampla, rotunda; columellâ latâ, excavatâ, albâ; facie ventrali testæ quasi attritâ, et maculâ fuscâ notatâ; fauce castaneâ, anticè albo-vittatâ. Long. $\frac{3}{4}$, lat. $\frac{1}{2}$ poll. *Hab.* San Francisco.

Remarkable for the amplitude of the aperture, the broad excavated columella, apparently ground away by the protrusion of the operculum.

Littorina lepida. Testa parva, solida, elongata, biconica, nitida, livida vel sanguinea albido tessellata vel zonata præsertim propè suturam et ad peripheriam, spiraliter crebrè et tenuiter puncto-striata: spira acuto-conica, anfr. 5, ultimo angulato: apertura ovata; labro acuto, pallido; fauce rubrâ, albo-zonatâ; columellâ planulatâ, sanguineâ. Long. $\frac{3}{5}$, lat. $\frac{2}{5}$ poll. *Hab.* Puget Sound.

A small, biconical species like L. *lineata*, characterized by its finely puncto-striate sculpture, its range of articulate spots, and by the blood-red color of the columella.

Littorina scutulata. Testa parva, ovato-conica, plerumque erosa, castanea vel livida albido inordinatim maculata, striis obsoletis cincta: spira anfr. 5, ultimo ventricoso: apertura latè ovata; labro acuto, pallido; columellâ planatâ, antrorsum expansâ; fauce livido. Long. $\frac{3}{5}$, lat. $\frac{2}{5}$ poll. *Hab.* Puget Sound.

Allied to L. *tenebrosa*, but has a more elongate and acute spire; also to L. *lepida*, but is more inelegant, and without the coloring of the base and aperture of that shell.

Littorina caliginosa. Testa parva, ovata, tenuis, lævis vel lineis incrementalibus striata, epidermide fusco-virente luteo maculato induta: spira, apice erosà, anfr. 4 – 5, ventricosis; suturâ profundâ: apertura vix $\frac{1}{2}$ longitud. testæ adequans, rotundato-ovata; labro continuo, acuto, pallido, vix everso; fauce livido. Long. $\frac{1}{5}$, lat. $\frac{1}{8}$ poll. *Hab.* Terra del Fuego.

Has the general characters of small specimens of L. *tenebrosa*, and its structure and color give it somewhat the aspect of a fresh water shell.

Littorina acuminata. Testa parva, solida, nitida, elongata, conico-turrita, livida obscurè flammulata interdum maculis albidis articulatis cincta: spira acuta, anfr. 6, planulatis, ultimo subangulato; suturâ profundâ; apertura ovata; columellâ nitidâ, moritinctâ. Long. $\frac{3}{10}$, lat. $\frac{1}{5}$ poll. *Hab.* Mangsi Island.

A small, much elongated species in the style of L. *lineata*, known by its regular grooving, and its mulberry-tinted columella.

Littorina plena. Testa parva, solida, ovata, cinereo-olivacea, interdum albido reticulata, striis spiralibus insculpta: spira parva, acuta, anfr. 5, ultimo globoso, subangulato; suturâ profundâ: apertura parva, dilatata et angulata; columellâ planulatâ, rufâ, albido marginatâ; fauce castaneâ, albo-zonato. Long. $\frac{1}{4}$, lat. $\frac{1}{5}$ poll. *Hab.* San Francisco.

The globoseness of the last whorl is remarkable. It is less elongated than L. *acuminata*, and smaller, more polished, and with a smaller aperture than L. *scutulata*.

Stilifer acicula. Testa minuta, imperforata, elongato-subulata, acutissima, ad apicem integerrima et lentè distorta, nitidissima, livido-lactea interdum flavescente: spira anfr. ad 12 planulatis; suturâ lucidâ: apertura angusta, ovalis; labro simplici, antrorsum arcuato, anticè evoluto; columellâ vix arcuatâ. Long. $\frac{3}{8}$, lat. $\frac{1}{10}$, *Hab.* Fejee Islands, in Holothuria.

A much more delicate species than any one of *Stilifer* or *Eulima* described. The little *Phasianella stilifera*, Turt. (*Stilifer turtoni*, Brod.) is somewhat like it. S. *subulatus*, from the West Indies, is much less slender.

Solarium egenum. Testa parva, ovato-conica, exalbida, submargaritacea: spira anfr. 6 convexis, liris acutis 4 cinctis, posterioribus granulatis: basis convexiuscula, perforata; umbilico scalariformi, ad ambitum acuto, crenulato: apertura circularis; labiis ferè continuis. Diam. $\frac{3}{10}$, alt. $\frac{1}{4}$ poll.

The characters of this shell do not bring it strictly within the typical form of *Solarium*, but its facies is rather that of *Solarium*

than of *Trochus*. It is to be grouped with S. *dealbatum*, Hinds, which it closely resembles. It is also similar in form, color, and size to *Margarita obscura*, Couthouy. Perhaps it would come under the genus TORINIA, Gray.

Dr. Gould presented to the Society an imperfect specimen of *Anodon gigantea*, Middendorff, from the river Onon, northern Siberia, received from the describer. It was 11 inches long, and 6½ high.

Dr. Cabot exhibited to the Society the following birds, new to the collection, which had been recently mounted for the Cabinet; viz., *Picus auratus*, male, presented by Wm. Minot, jr.; *Aix sponsa*, male, presented by Mr. Robert Holl; *Mergus serrator*, female, presented by Mr. F. H. Jackson; *Ortygometra carolinensis*, presented by Mr. Nathan Robbins; *Fuligula marila*, male, presented by himself; *Mergus cucullatus*, young male, purchased in Boston Market; *Picus pileatus*, male; *Anöus* ——, *Tetrao rupestris*, male, from Newfoundland; and *Astur cooperi*, female, received in exchange.

December 6, 1848.

Dr. C. T. Jackson, Vice President in the Chair.

Present, nineteen members.

Mr. Desor gave an account of his investigations to ascertain the true character of the ovarian egg. He stated that up to the present time the yolk had been regarded by embryologists as a homogeneous, granular mass. This has been considered its fundamental character. Mr. Vogt, in studying the embryonic development of the *Salmonidæ*, had noticed that in the ovarian egg the granules of the yolk showed a disposition to accumulate around the germinative vesicle, and in course of time became condensed about it. Mr. Desor had, he said, noticed similar appearances in the ovarian egg of *Nemertes* and *Ascidia*. The egg of the latter is at first merely a transparent cell, containing the germinative vesicle, about which, at an early stage of development, a cloud of small granules seems to be forming. These granules are probably cells. As the process goes on, the surrounding area becomes crowded with them, but they are the most numerous near the germinative vesicle. At a later stage the granules recede from the circumference of the sphere, to become compact about the germinative vesicle, forming the perfect yolk, and leaving the surrounding space filled with a transparent fluid. This liquid has been hitherto regarded by embryologists as albumen. As Mollusks, however, have no oviduct in which albumen could be formed, this cannot be its true character. Mr. Desor had therefore been led to the conclusion that it is a true "mother liquid," from which the yolk has been precipitated, crystallized, as it were. It must for this reason be the most important part of the ovum, and accordingly he proposes for it the name "*Biogen liquid*." The facts observed in the development of Mammalia strongly inclined him to the opinion that this process of precipitation from the Biogen liquid would be found to be universal. Bischoff has figured the Rabbit's ovum surrounded by the chorion, with the whole of the enclosed space filled up by the yolk. As development goes on, the yolk is found not to occupy the whole interior, but it is occupied in part by a clear fluid, which surrounds the yolk, the nature of which Bischoff acknowledges he is at a loss to understand. This, Mr. Desor suggested, is probably the Biogen liquid. Thus it would appear that all yolks are formed by condensation: a fact of great interest, indicating as it does, that the great law of attraction is at the bottom of the formation of organic, as well as inorganic bodies; and that the same force which has condensed the heavenly bodies, acts with equal power in uniting the particles which make up a living animal.

As soon as the egg enters upon its organic life it begins to revolve, and in this movement we have another coincidence with the order of things in the formation of the planetary system, according to the nebular hypothesis.

With regard to Fishes, Mr. Desor remarked that it is not yet certain that in their embryonic development they follow exactly the process which has been observed in the ova of other animals. In the ovum of this class while yet in the ovary, the yolk substance, containing a number of oil drops, fills the whole space. When more developed it is separated from the circumference of the ovum by a transparent interval. It is a question yet undecided whether there exists a true shell-membrane in these eggs, through which water may have penetrated by *endosmose*, following the condensing yolk.

Here Mr. D. read a letter addressed to him by Prof. Gilman, of New York, confirming his observations, and coinciding in his views with regard to the Biogen liquid, but going even further than Mr. D. himself; and showing that, by his own researches, he had ascertained that even the germinative vesicle is formed from it. He also expressed his belief that a shell-membrane exists in the ovarian egg of most Fishes, and that the liquid between it and the yolk-membrane must have entered by *endosmose*. So that for the present, the embryonic development of this class of animals would seem to be an exception to the general rule.

Mr. Ayres stated that he had recently been engaged in a careful dissection of *Catostomus*, to ascertain whether there exists in this fish the curious arrangement of the muscular apparatus of the pharyngeal bones, which he had demonstrated in the genus *Leuciscus*. (See Proceedings, June 21st, 1848.) He had found that although the same muscles exist in the throat of *Catostomus* as in *Leuciscus*, their insertion is different. They are inserted directly into the second branchial bone. The little needle-like bones, which in *Leuciscus* show such an ingenious contrivance, do not exist in *Catostomus*. Mr. Ayres said he had found them in all the species of *Leuciscus* which he had examined.

Dr. C. T. Jackson, in reference to Mr. Desor's remarks at the last meeting, stated, that on the coast of Maine, near Newcastle, there exists an oyster bank, sixty feet thick, similar to that on Nantucket, containing various species of Mollusks, of which living specimens may be obtained in the vicinity, but in deep water. Ignorant of this fact, and knowing that they do not now exist on the shores of Maine, Mr. Lyell had been led to the erroneous conclusion that they now belong only to more northern latitudes.

In reply to a question from Mr. Desor, as to his opinion of the age of the American Continent in comparison with that of the other continents, Dr. C. T. Jackson said, that it was his belief that the American Continent was upheaved the first, as the granite bears obvious marks of greater age. Mr. Desor replied that he did not consider this evidence conclusive as to the continent's having been upheaved above the *water level.*

Dr. Bacon presented, in the name of Mr. William Stimpson, specimens of dendritic oxyde of Manganese on slate, from Charlestown, Mass., and Shark's teeth from the green sand of New Jersey. He also presented minerals from Mexico, consisting of silver ore, crystallized calcareous spar, and calcareous sinter, from Rio del Munte and its vicinity; and opal from Guanaxuato, received in exchange, from Lieut. J. McNab, U. S. A. He also announced that there had recently been purchased by Mr. Alger, for the Society, mineralogical specimens to the value of $175; this being the balance of a sum of $300, which Mr. A. had been authorized to expend for this purpose, from the funds raised by him in 1847 in aid of the Society. Dr. Bacon also presented from Mr. Alger, specimens of Hematite, from Amenia, N. Y., Fluor-spar, from Cumberland, Eng., and variegated Copper Ore from the Bruce mine, on the north shore of Lake Huron.

Dr. Cabot exhibited a number of birds, which had been recently mounted for the Society's collection. Among them were the *Roseate Tern, Sterna paradisea,* obtained by him at Beverly, Mass., the most northern locality in which it had as yet been found; and *Saltator raptor*, a Yucatan species, described and figured by him in the Journal of the Society, Vol. V., p. 90, as *Pyrrhula raptor.*

Mr. Ayres presented to the Society a number of specimens of the *Cyamus ceti,* Whale louse, attached to a piece of skin of the Right Whale.

December 20, 1848.

The President, in the Chair.

Present, twenty-two members.

Dr. Gould presented descriptions of the following shells brought home by the U. S. Exploring Expedition:

TURBO CONFRAGOSUS. Testa solida, albida, pyramidata, rudis, rugosa; rugis parvis, obtusis, ad peripheriam et ad angulum anfractuum interdum in spinis compressis prominulis productis: spira anfr. ad 6, angulatis superné declivibus, ultimo ad peripheriam acuto; suturâ callosâ: basis planulata, liris squamosis concentricis inequalibus ad 8 cincta: apertura circularis; labro acuto, perobliquo; columellâ curtâ anticè dentatâ; fauce margaritaceâ. Lat. 1$\frac{1}{8}$, alt. $\frac{7}{8}$ poll. *Hab.* Dean's Island, Paumotu group.

This species has the low conical form, and bony aspect of the stellate species found in the West Indies. I know of no other

similar one from the Pacific. Its wrinkled surface, polygonal whorls, and the squamous basal ridges mark it.

Turbo sirius. Testa parva, imperforata, pyramidata, dilutè beryllina, leviter corrugata; spira anfr. 4 conicis, infra obliquè plicatis, ad peripheriam acutis et spinis compressis ad 18 armatis: basis planulata, stellaris, liris concentricis muricatis ad 5 insculptis; regione columellari arcuatâ, lævigatâ; labro perobliquo. Diam. $\frac{1}{2}$, axis $\frac{3}{10}$ poll. *Hab.* New Holland.

The multitude and regularity of the triangular projections of the periphery, when viewed from below, give the base a beautiful star-like form, much like T. *stellaris.*

Turbo laciniatus. Testa rudis, depresso-conica, cinerea roseo-tincta: spira anfr. 4, irregulariter plicatis, plicis ad peripheriam acutissimis, dilatatis et in spinis elongatis compressis excurrentibus: basis convexiuscula, liris muricatis concentricis 10 – 12 insculpta: apertura circularis; columellâ lævi, arcuatâ, roseâ; labio perobliquo: faux margaritacea. Lat. $\frac{3}{4}$, alt. $\frac{3}{5}$ poll. *Hab.* Manilla.

Closely allied to T. *rhodostomus*, Lk., but wants the double series of spines at the periphery.

Trochus pruninus. Testa solidula, elevata, ovato-conica, lævis, nitida, prunina, lineis capillaceis numerosis cincta: spira anfr. 7 convexiusculis, ultimo subangulato; suturâ profundâ: apertura subcircularis; columellâ rotundatâ, albâ, anticè roseo-tinctâ, subsinuosâ: interior margaritacea, vividè iridescens. Alt. $\frac{7}{8}$, lat. $\frac{7}{10}$ poll. *Hab.* Auckland Island.

This peculiarly colored species has the form, thickness, and appearance of the delicately lineated specimens of *Littorina angulifera.*

Trochus texturatus. Testa conica, imperforata, solida, cinerea viridi vel roseo-tincta, liris volventibus roseo-maculatis et laminis incrementi tenuibus clathrata: spira anfr. 7, vix convexis, ultimo sub-angulato: apertura rotundata, anticè evoluta; columellâ rotundatâ, labro declivi, acuto: interior margaritacea, iridescens. Alt. 1, lat. $\frac{7}{10}$ poll. *Hab.* New Zealand.

This may be well compared with the coarse, solid, sulcated variety of *Littorina angulifera.*

Trochus ligatus. Testa solida, ovato-conica, imperforata, costulis rotundatis flavescentibus ubique cincta, intervallis incarnatis concinnè clathratis, ad apicem violacea: spira anfr. 6 convexis: apertura circularis; columellâ rectâ rotundatâ; labro crenulato: regio umbilicalis vix indentata. Alt. $\frac{3}{4}$, lat. $\frac{2}{3}$ poll. *Hab.* Puget Sound.

This shell resembles, in most respects, T. *doliarius;* small specimens are like *Margarita cinerea*, Couth.

Trochus pupillus. Testa parva, elevato-conica, margaritacea extrinsecus incana, filis virido-fuscis ubique cincta, ad intervallos minutissimè clathrata: spira anfr. 6 convexis: basis planiuscula, fissurâ umbilicali perforata: apertura circularis; columellâ arcuatâ: faux fulgida, minutissimè punctata. Lat. $\frac{1}{4}$, alt. $\frac{3}{10}$ poll. *Hab.* New Zealand.

Somewhat similar to T. *ligatus*, but much smaller, more delicate, more nacreous within, and partially umbilicated. It is still more like *Margarita cinerea*, but is more solid, and more delicately marked.

Trochus jucundus. Testa parva, solida, conica, flammulis radiantibus invicem coccineis incarnatis et albis picta: spira anfr. 6 sub-angulatis, filis granulosis alternis minoribus cinctis: basis convexiuscula, imperforata, liris concentricis linearibus articulatim pictis insculpta; regione umbilicali indentatâ: apertura rhomboidea; columellâ arcuatâ, lævi; labro simplici. Long. $\frac{2}{5}$, alt. $\frac{3}{8}$ poll. *Hab.* New Zealand.

A very beautiful shell, both in color and sculpture, quite distinct from any described species.

Trochus gradatus. Testa parva, solida, perforata, ovato-conica, turrita, cinerea ferrugineo-flammulata: spira anfr. 5, declivibus, ultimo carinis duabus biangulato quorum suprema secundum spiram volvat; interspatio trilineato et concinnè clathrato: basis convexiuscula, liris granulatis concentricis ad 8 insculpta; umbilico amplo, infundibuliformi: apertura circularis; columellâ tenui, rectâ, anticè dentiferâ. Alt. $\frac{3}{8}$, diam. $\frac{2}{5}$ poll. *Hab.* Pacific Islands.

In most respects it is like T. *eximius*, Reeve, which, however, is imperforate. It is also somewhat like T. *sulcatus*, Wood's Sup.

Trochus acinosus. Testa solida, convexo-conica, æruginosa, seriebus 4 papillarum insignis et lineolis capillaceis volventibus ubique insculpta; serie anticâ majori: spira anfr. 6 planiusculis, ultimo acutangulato: basis excavata, cinerea, filis concentricis fuscis cincta; interspatiis indentatis; regione umbilicali infundibuliformi et costis duabus tri-partitâ: apertura rhombea; columellâ lævi, contortâ; labro simplici, perobliquo. Diam. $\frac{4}{5}$, alt. $\frac{5}{8}$ poll. *Hab.* New Zealand.

The peculiarities of this species are, the series of tubercles on the delicately lineated ground, the excavated base with its thread-like unbeaded lines, and the two white ribs in the umbilical pit. May be compared with T. *vernus*, Chem.

Trochus elisus. Testa parva, elevato-conica, imperforata, cinerea: spira anfr. 6 declivibus, suturâ fossali valdè profundâ discretis, costulis transversis granosis tribus (quorum intermediani minore) cincta, interspatiis clathratis: basis convexa, costulis clathratis insculpta: apertura subcircularis; columellâ granulatâ; labro intus sulcato. Diam. $\frac{3}{8}$, alt. $\frac{1}{2}$ poll. Dredged at Singapore.

Distinct from any described species. Its markings are deeply sculptured, and its peculiar sutural region is a character which cannot fail to be noticed at first glance. It is quite probable that it may be colored differently when quite fresh.

Mr. E. C. Cabot read a paper giving an account of some researches he had made during the last autumn, in company with Mr. Desor, to determine the fact of the constant presence of fresh water in Dune sand and sand spits. These researches were conducted at Cape Cod, which they visited for that purpose in the U. S. Surveying Steamer Bibb, under the command of Lieut. Davis, with whose assistance they were made.

In every instance where there was a body of sand above the tide level, with salt water on opposite sides, or entirely surrounding it, *fresh* water was discovered on digging to a moderate depth. Thus at Monomoy, a long, low island of sand, south of Cape Cod, fresh water was found at its highest part, at a depth of *two* feet. On the beach, at the line of high water, it was obtained almost on the surface. The same fact was observed on Sandy Neck, a long sand peninsula, which separates Barnstable Bay from Barnstable Harbor, and at Provincetown. At the former place, it is particularly striking, as good water is very scarce in the town of Barnstable, on the main land directly opposite. In this town is a well, about one hundred and fifty feet from the shore, in which the water rises and falls with the tide, although only through a space of one foot and a half.

As yet, Mr. Cabot had not been able to satisfy himself whether the amount of rise and fall in wells showing this sympathy with tidal fluctuations, depends upon their distance from the salt water or not. Since making these observations he had noticed that such a rise and fall is not limited to wells in a natural formation. He had observed that in loose deposits of an artificial character, in the vicinity of salt water, they also occur. Thus, in Suffolk street, which is laid out on newly-made land, this fluctuation takes place in the wells; and in some trenches which he had caused to be dug recently in Charles street, for the foundation of a building, at high tide fresh water makes its appearance, while at low tide they are empty. An interesting inquiry suggests itself as to the origin of these deposits of fresh water in such loose soil. They cannot be derived from springs, for these occur distinct from them, in the same formations, and present peculiar characters of their own; often bubbling out from the surface of the sand, even below the line of high water on beaches. It might be supposed that they are the result in part of a filtration of the salt water through the sand. To test this, Mr. Cabot poured a quantity of salt water through sand, and found that it lost two per cent. of its specific gravity; a curious and unexpected result, but not sufficient fully to explain the case. On the whole, he was inclined to accept the opinion of Mr. Mather, that these supplies of fresh water are derived from rains, and are prevented from oozing out laterally, by the pressure of the neighboring salt water. As this advances, it recedes, and its level rises; as the tide goes out, it follows, and its level is depressed. The practical result from these investigations is, that it will undoubtedly be found that in all deposits of sand like those examined by Mr. Cabot, an abundant supply of fresh water may be obtained at all times; a fact of great importance to mariners.

Mr. Ayres stated that he had made similar observations to those of Mr. Cabot.

He knew of an instance of a sand bank, eight feet high, formed within his recollection, in which fresh water might be obtained at the depth of eighteen inches. At Sag-Harbor, where he had resided for some years, there is a well, about forty rods from the tide, in which the water rises and falls four feet, a little after the tide. A little further from the shore is another, which rises and falls two feet; a well still further off, rises and falls one foot; at a short distance above this is one which is not sensibly affected.

Mr. J. E. Cabot mentioned a statement of Darwin's, that on the Coral Islands of the Pacific, fresh water may be easily procured by digging a short distance below the surface.

Dr. Pickering stated that he had himself seen the natives of these islands obtain a supply whenever it was wanted, by making a slight excavation. In reply to a question from Mr. Ayres, whether the water in the lagoons of these islands is always salt, he stated that so far as he had examined them it is so. They either communicate directly with the sea, or else are separated from it by a barrier over which it easily passes in storms. In reference to the point that fresh water in sand deposits does not necessarily correspond in level with the neighboring salt water, he called the attention of the Society to the fact, that imbibition or capillary attraction affords a ready means of accounting for it. In Lower Peru, where it never rains, and the country is fertilized by irrigation, he remarked that the soil is found to be moist several feet above the surface of the water in the canals.

A gentleman present, not a member of the Society, suggested that the difference of specific gravity of salt and fresh water might be a satisfactory reason for their not intermingling in the sand formations examined by Mr. Cabot.

The subject under consideration suggested to the President some interesting facts and questions as to the nature of springs and wells.

It was impossible, he said, to account for the water in the wells of Boston, by the supply afforded by rains alone. Water is found abundantly in places at so great an elevation that mere drainage could not have furnished it. It would seem, therefore, that it must have been brought by underground currents, perhaps from a great distance, following the course of an impervious underlaying stratum. Such an underground current he stated to exist at the south part of the city. The President also stated that in the vicinity of the state-house, there is a very deep well which rises and falls with the tide.

Dr. Cabot called the attention of the Society to a communication which had appeared in several newspapers of this city, over the signature of Prof. Horsford, of Harvard University, in which he attributes the form in which the gold is found in California, to the grinding action of glaciers. Dr. Cabot wished to know whether those gentlemen of the Society most conversant with such subjects, coincided with Prof. Horsford in his views.

Mr. J. D. Whitney said he saw no sufficient reason for calling in the glacial theory to explain the phenomena in question, since gold is very commonly found in vein rock, either in the form of rounded grains or scales. Simple decomposition of the rock would liberate it in the shape in which it is found in California.

Mr. Desor said that the movement of glaciers is so slow, he doubted if they could by any possibility produce such a violent disruption and grinding to powder of the rock formation, as Prof. Horsford supposes to have taken place. Neither does it appear that there are any striæ on the surface of the rocks in place, such as are invariably found in the track of a glacier. Nor was Mr. Desor aware that any evidence had been heretofore adduced, of the existence of glaciers at a point so far to the south, on the North American continent.

Mr. J. D. Whitney gave the results of the chemical examination of three minerals, described as new species, by Prof. C. U. Shepard, (Am. Jour. of Science, New Series, Vol. 2, p. 249,) namely, Arkansite, Ozarkite, and Schorlomite. These minerals are all from the same locality, in Arkansas.

The first, Arkansite, which Prof. Shepard supposed to be a niobate of yttria and thorina, is titanic acid, with a little iron, crystallized in the form of Brookite, and having the specific gravity of that variety of titanic acid, while it has, at the same time, the opacity and color of nigrine, a variety of rutile. Ozarkite is a zeolitic mineral, a silicate of alumina and lime, with a little soda. It is probably scolezite. Among the specimens of the third mineral, schorlomite, there appear to be at least two distinct substances. One is colophonite, or lime-iron garnet, which occurs both massive and crystallized; the other is a substance considerably resembling black garnet in external characters, but which proved, on chemical examination, to be a new titaniferous silicate. As this new mineral, however, differed so widely in chemical composition, and in certain important chemical characters, from Prof. Shepard's schorlomite, Mr. Whitney had given it a new and more appropriate name, and the name of schorlomite can be dropped till the real "hydrous silicate of yttria, thorina, and oxide of iron" shall be found. The name given to this new mineral is *Ferrotitanite*, in allusion to its analogy with titanite or sphene, and to its containing iron in addition to the elements of sphene.

Its chemical composition may be represented by the formula

$$(\dot{\mathrm{C}}\mathrm{a}^3\ \dddot{\mathrm{Si}} + \dddot{\mathrm{F\!\!\!-\!e}}\ \dddot{\mathrm{Si}}) + \dot{\mathrm{C}}\mathrm{a}\ddot{\mathrm{T}}\mathrm{i}^2,$$

which agrees very nearly with the results of the analyses of this mineral. For particulars of the examination of these minerals, see the Society's Journal, Vol. VI., No. 1.

Dr. Bacon exhibited eighty mineralogical specimens presented to the society by Mr. Alger. About a year since, Mr. A. offered the society the selection of four hundred specimens from his private collection. At that time eighty were taken, and the specimens now exhibited were a second instalment.

Dr. Cabot exhibited twenty-eight birds, which had been recently mounted for the Society. Among them was a remarkably fine pair of Argus pheasants, — *Argus gigas.*

Dr. Cabot announced, on behalf of Dr. Storer, that a specimen of the Nurse or Sleeper Shark, *Somniosus brevipinna,* ten feet in length, had been recently caught at Nahant. This is the second of that species, which has been captured in Massachusetts Bay within a year.

Dr. Henry Wheatland of Salem, was elected corresponding member, and Mr. James West, of East Boston, an immediate member of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING DECEMBER 31.

Transactions of the Entomological Society of London. Vol. V. Part 2. Lond. 1847. *From the Entomological Society.*

Journal of the Indian Archipelago, and Eastern Asia. Nos. 1 to 5 of Vol. II., and Supplement to No. 6 of Vol. I. 8vo. Singapore, 1847 – 8. *From the Editors.*

Bulletin de la Société Geologique de France. Deuxième Serie. Tome quatrième. Feuilles 53 – 62. (17me Mai, 1847.) Tome cinquième, Feuilles 4 – 8. (22me Nov. 1847 — 10me Janvier, 1848.) *From the Société Geologique.*

Annales de la Société Linnéenne de Lyons. Années 1845 – 6. 8vo. Lyons, 1847. *From the Société Linnéenne.*

Annales des Sciences Physiques et Naturelles, d'Agriculture et d'Industrie. Tome IX. Année 1846. 8vo. Lyons. *From the Société Royale d'Agriculture.*

Annals and Magazine of Natural History. No. X., for Oct. 1848. 2d series, Vol. II. *Courtis Fund.*

Mollusques Vivantes et Fossiles. Par Alcide d' Orbigny. Livraisons 1 – 7. 8vo. Paris, 1845. *From the Author.*

Audubon and Bachman. Plates 141 – 145, of Viviparous Quadrupeds of America. *From Subscribers.*

Silliman's American Journal of Science and Arts. 2d series. No. 18, for Nov. 1848. *Exchange.*

Recherches sur les Poissons Fossiles. Par Louis Agassiz. 6 vols. 4to. Planches, 3 vols. Folio. Neuchatel, (Suisse,) 1833–47. *From Hon. Nathan Appleton.*

Annals of the Lyceum of Natural History of New York. Vol. IV. No. 12. Sept. 1848. *From the Lyceum.*

Descriptions of new species of Bullia and Marginella. By J. H. Redfield. 8vo. Pamph. New York, 1848. *From the Author.*

Distinctive characters of Cypræa reticulata of Martyn, and Cypræa Histrio of Meuschen. By J. H. Redfield. 8vo. Pamph. New York, 1847. *From the Author.*

Annual Report of the Regents of the University on the condition of the State Cabinet of Natural History. 8vo. Pamph. Albany, 1848. *From the Regents of the University.*

Natural History of Fossils. By E. Mendes da Costa. Vol. I. Part I. London, 1757. *From S. G. Drake.*

Annals and Magazine of Natural History. 2d series, Vol. II. No. 11, for Nov. 1848. *Courtis Fund.*

Manual of Chemistry. By Wm. T. Brande. 8vo. London, 1819. *From G. B. Emerson.*

Book of Nature. By John Hill. Folio. London, 1758. *From G. B. Emerson.*

Smithsonian Contributions to Knowledge. Vol. I. 4to. Washington, 1848. *From the Smithsonian Institute.*

Journal of the Indian Archipelago. Nos. 6, 7, 8. Vol. II. Singapore, 1848. *From the Editors.*

Beschreibung der, in der Grossen Knochen Hohle, Tennessee, (Nord America,) gefundenen fossilen Knochen des Megalonyx laqueatus, von R. Harlan, M. D.; verdeutscht durch Charles Cramer. 8vo. Pamph. Moscau, 1847. *From C. Cramer.*

Memoirs of the American Academy of Arts and Sciences. New series. Vol. III. 4to. Cambridge and Boston, 1848. *From the American Academy.*

Gray's Genera of Birds. Part 46. Long 4to. London, Dec. 1848. *Courtis Fund.*

Annals and Magazine of Natural History. 2d series. Vol. II. No. 12, for Dec. 1848. *Courtis Fund.*

January 3, 1849.

The President, in the Chair.

Present, twenty-nine members.

Mr. Teschemacher called the attention of the Society to the fact, that some years since, he had exhibited, at one of its meetings, specimens of a curious slaty substance found in digging a well in Newton, on which were beautiful dendritic forms. At that time his impression, and that of Mr. G. B. Emerson was, that these markings were the remains of sea-weed, and were produced by external pressure. Analysis showed them to be composed of Manganese. Mr. Teschemacher, at that time, tried the experiment of pressing clay between layers of glass, and succeeded in producing similar appearances.

He now had to exhibit to the Society a *Venus*, from the Nantucket oyster bank, which bore on its inner surface, precisely similar dendritic markings, of a reddish color, following the line of a crack. He was inclined to consider these markings also as due to sea-weed, subjected to pressure. Their chemical character was the same as that of the specimens formerly exhibited. He was unable as yet, to say whether Manganese is a constituent of sea-weed, or not. The lines are somewhat finer than the fibres of the sea-weed, but this he thought might be explained by supposing Manganese to be present in very small quantity, while the other constituents of the sea-weed had disappeared. The color was also to him an evidence of the origin of these markings.

Mr. Teschemacher also stated that these forms had been found on the new mineral, *Idocrase*, found by Prof. Webster, in Maine. As this is an eruptive mineral, of course it can contain no sea-weed. In this case he supposed liquid Manganese had been subjected to pressure. Manganese is an element in *Idocrase*, but as its quantity is not constant, he did not consider it an essential ingredient.

Dr. Gould asked, if pressure had caused the appearances in question, how could this explanation be admitted, in the case of the markings on the Venus? The specimen was from the Nantucket bluff, remarkable for the undisturbed and unopened condition, and perfectness of its shells. If the markings were caused by sea-weeds, he thought the red color might be explained without ascribing it to Manganese. All the deep water sea-weeds, and animals, such as Crabs and Star-fishes, are red when first drawn up, but turn green in a short time.

Mr. Teschemacher replied that he had been unable to ascertain whether the particular shell exhibiting the markings in question, had been subjected to pressure or not. As to the change of color referred to by Dr. Gould, he remarked that the mineral Chameleon, which changes its color so curiously under the influence of light, is an oxide of Manganese.

Mr. J. D. Whitney said he did not consider pressure necessary to explain these phenomena. The dendritic is a well known form of crystallization. On the shell exhibited, it followed the line of a crack, as is often seen in chemical experiments.

Dr. Bacon stated that he had seen such forms on Quartz crystals, where there was no crack to guide them. It was evident, therefore, that such an arborescence might be independent of any leading line.

Mr. J. D. Whitney read the following remarks on the composition of Chloritoid or Chlorite-spar, and Masonite.

"The true chemical composition of the substance called chloritoid is a matter of some uncertainty. Bonsdorff, who, according to G. Rose, undoubtedly analyzed the real chloritoid, in which water was an essential ingredient, gave as the result of his analysis,

$$\left.\begin{array}{l}\dot{\mathrm{F}}\mathrm{e}^{3}\\ \dot{\mathrm{M}}\mathrm{g}^{3}\end{array}\right\}\dddot{\mathrm{S}}\mathrm{i}+\dddot{\not{\mathrm{A}}}\mathrm{l}^{2}\,\dddot{\mathrm{S}}\mathrm{i}+3\,\dot{\not{\mathrm{H}}};$$

the ratio of the oxygen of $\dot{\mathrm{R}}$, $\dddot{\not{\mathrm{A}}}\mathrm{l}$, $\dddot{\mathrm{S}}\mathrm{i}$ and $\dot{\not{\mathrm{H}}}$, being

7.88 : 16.61 : 14.27 : 6.17, for which he adopted the ratio 3 : 6 : 6 : 3. Rammelsberg has taken the ratio as 3 : 6 : 5 : 2, and gives the formula of this mineral as

$$3\,\dot{R}^3\,\dddot{Si} + 2\,\dddot{Al}^3\,\dddot{Si} + 6\,\dot{H},$$

which requires

Silica	25.18
Alumina	33.61
Protoxide of iron	35.31
Water	5.88
	99.98

Erdmann has analyzed a mineral supposed to be the chlorite-spar or chloritoid described by Fiedler, and gives as the result of two analyses, agreeing closely with each other, the formula,

$$\dot{Fe}^3\,\dddot{Si} + \dddot{Al}^3\,\dddot{Si}.$$

The substance analyzed by Erdmann did not contain water, and there seem to be two distinct substances, one of which is a hydrous silicate, and the other anhydrous. That the analysis of Bonsdorff was probably correct, is shown by the following analysis of the mineral described by Jackson as Masonite, which I find to have the same composition as the chloritoid of Bonsdorff, which it closely resembles in external characters.

The results of an analysis of Masonite were as follows :

		Oxygen.	Ratio.
Silica	28.27	14.55	3.2
Alumina	32.16	15.02	3.3
Protoxide of iron	33.72	7.49	1.6
Magnesia	.13		
Water	5.00	4.44	1.
	99.28		

The ratio of $\dddot{Si}$, $\dot{Fe}$, $\dddot{Al}$, and $\dot{H}$, being nearly 6 : 3 : 6 : 2, the formula will be

$$\dot{Fe}^3\,\dddot{Si} + \dddot{Al}^2\,\dddot{Si} + 2\,\dot{H},$$

which is that given by Bonsdorff for chloritoid, with one atom of water less, which we may easily conceive to have been stated too high, if the mineral had not been carefully dried, especially as there is an excess of 1.6 per cent. in the analysis.

The formula given above requires

Silica	28.56
Alumina	32.06
Protoxide of iron	33.60
Water	5.60
	100.02

This, it will be seen, agrees very nearly with the results of the analysis; I would therefore suggest that the name of Masonite should be retained for the hydrous chloritoid, as the formula given by Erdmann has been generally adopted for what is supposed to be the real chloritoid.

Mr. Whitney made some remarks on the remarkable vein of black oxide of copper which was formerly worked at Copper Harbor, Lake Superior, but which was abandoned after some forty or fifty thousand pounds of this very valuable ore had been raised. It was the only vein of this substance, and perhaps the only locality known in the world, and specimens will be highly prized by the mineralogist hereafter. The substance called copper-black, and sometimes, black oxide of copper, which occurs in an earthy, pulverulent form, is not to be confounded with the pure oxide of copper found at Copper-Harbor. Copper-black is a mixture of various hydrated oxides, especially of iron, manganese, and copper, of which the latter forms but a small portion; it occurs as an incrustation on other ores of copper, and is evidently the result of their decomposition. Semmola, however, has described a substance occurring in small tabular crystals, belonging to the hexagonal system, which, according to him, are pure oxide of copper, $\dot{\mathrm{Cu}}$. To this substance he has given the name of Tenorite. The oxide of copper found at Copper-Harbor is generally compact, though the purer specimens have a crystalline structure. Mr. Teschemacher has, however, two specimens, which he has kindly allowed me to examine, in which this substance is distinctly crystallized in cubes, with their solid angles replaced. The question arises, was the substance described by Semmola as crystallized in the hexagonal system, really $\dot{\mathrm{Cu}}$, or is this substance dimorphous?

Some portions of the oxide of copper from Copper-Harbor are almost chemically pure, though it is generally mixed with a little silicate of copper. One of the purest specimens contained only 1.2 per cent. of impurities, mostly silica, with traces of lime and iron.

As the oxide of copper of this remarkable vein has not been mineralogically described, the following description is added.

Substance tesseral, crystallized in cubes, with their solid angles occasionally replaced; generally, however, massive, with crystalline structure, sometimes earthy; no traces of cleavage; H. = 3; S. G. = 6.25; color, steel-gray to black; lustre, metallic, the earthy varieties acquire a metallic lustre on being scratched or cut with a knife; opaque; chemical composition, $\dot{\mathrm{Cu}}$, almost pure; containing

Copper	79.86
Oxygen	20.13

Mr. E. C. Cabot stated that since the last meeting he had made some experiments to ascertain, if possible, the cause of the non-intermingling of salt water with fresh, in dune sand.

Having nearly filled a vessel with salt water, he immersed in it a large sponge saturated with fresh water, containing imbedded in it, perpendicular tin tubes, with perforated sides. The external pressure caused water to appear in these tubes, and to rise to the level of the surrounding fluid. After standing some hours, the water in these tubes was found to be fresh. On reversing the experiment, placing the sponge full of fresh water first in the vessel, and gradually filling the surrounding space with salt water, the same result followed. Capillary attraction seemed to be the force which kept the different fluids apart. With regard to the difference between fresh water in dune sand and springs, Mr. Cabot said he did not consider it an essential one. In the former case, the water formed, so to speak, a homogeneous spring; in the latter, underlying strata, and lateral boundaries limited it, and gave it the character of a current.

In connection with this subject, Mr. Ayres said that since the last meeting, he had read, in Capt. Henry's account of Mexico, some interesting facts. It was there stated that at Corpus Christi, fresh water could be procured within a few rods of the sea, by digging in the sand beach. At the depth of two or three feet, the water was fresh, but on digging deeper salt water was found. Capt. Henry also mentions the existence of fresh-water ponds, separated by only a small ridge from the Gulf, and in their immediate vicinity salt ones, under precisely similar conditions. The Secretary suggested that the salt ponds might have been more recently cut off from the sea than the others, and had not yet had time to undergo transformation.

The President recurred to the subject of the mastodon, spoken of by him at the last meeting, in order to answer a question which had been put to him by Dr. J. B. S. Jackson, as to the number of species of this extinct genus. He stated it to be his present opinion that there are but two species known, *M. giganteus* and *angustidens*, and in North America there has as yet, been found only one, the *giganteus*. In the present imperfect state of our knowledge of the fossil bones of the mastodon found in South America, New Holland, &c., he should be inclined to refer them, he said, to *M. angustidens* rather than to any other species.

Dr. Cabot said he thought such an opinion should be accepted with some hesitation, as it would be entirely at variance with the facts usually observed in the distribution of animals. He thought it impossible, under the present geographical conditions, that the *angustidens* could have passed by way of the continent of Asia and the North-west coast of America, to South America, without leaving traces of its existence in North America.

Dr. Cabot exhibited a number of birds which had recently been mounted for the Society, among which were two of special interest, from Europe; viz., *Corvus corone*, and *Buteo vulgaris*. *Corvus corone*, Dr. Cabot remarked, had been commonly confounded with the common American Crow. He was satisfied, however, that it is a distinct species. The common name of the European bird, viz., the Carrion Crow, points to a characteristic difference of habit. The feathers of the breast and front of the neck are stiff, sharp-pointed, and lustrous, in the European bird, very much like those of the Raven; while in the American species they are soft, downy, and uniform. The bill of the European species is also more hooked than that of the American.

The common Buzzard of Europe, *Buteo vulgaris*, has been by some regarded as identical with the American species; but from a slight examination of the specimen before the Society, Dr. Cabot was disposed to doubt the correctness of this opinion. The American is a southern species, the European a northern one. So far as careful comparisons have been made, none of the species of birds in the middle temperate regions are the same in both continents.

Dr. Wyman presented in the name of Dr. Mantell, of London, a monograph on the *Iguanodon*, and one on *Belemnites*. The thanks of the Society were voted to the donor.

Mr. B. S. Shaw was elected a member of the Society.

January 17, 1849.

The President in the Chair.

Present, twenty-one members.

Mr. J. E. Teschemacher exhibited a specimen of *Harmotome*, from Isle Royale, Lake Superior, the first of this species that has been found on this continent; it was collected on *Datholite*, by Mr. J. H. Blake, who passed the summer of 1847 in those regions.

Harmotome is one of the rarest of those silicates which are usually found in Trap formations, and generally occurs in macled crystals ; the form is a right rectangular prism.

At Strontian, in Scotland, it is sometimes found in uncombined crystals; a figure of one of which is given in Dana's Mineralogy, p. 332; the crystals on this specimen resemble those, and like them, are found coating carbonate of lime. *Harmotome* may therefore be added to the list of American minerals.

Mr. Teschemacher also exhibited specimens of a new mineral from the Cliff mine on Lake Superior, resembling in many of its properties *Volborthite*, a Vanadiate of Copper.

Dr. Gould presented descriptions of the following shells, brought home by the U. S. Exploring Expedition :

Trochus bicrenatus. Testa pyramidata, flavescens, flammulis rufis alternis saturatioribus ornata, lineis equalibus granulosis cincta: spira anfr. 7 – 8, penè concavis, ad peripheriam acutis et denticulis roseo-crenulatis ad 15 munitis: basis planulata; vortice umbilicali eburnea: apertura trapezoidea; columellâ contortâ. Diam. $\frac{7}{8}$, alt. $\frac{3}{5}$ poll.

The species most resembling it are T. *fimbriatus*, Lam., and T. *Buschii*, Phil.; but from these and all others, it is well distinguished by its doubly crenate margin, as viewed from below. The profile outline is a little concave.

Trochus circumsutus. Testa solida, elevata, accuratè conica, imperforata : spira anfr. 9, subangulatis supernè declivibus, infra nodis obliquis et liris granosis cinctis : color cinerea, portionibus cavatis saturatè olivaceis suturas similantibus : basis planulata sulcis filiformibus concentricis ad 12 insculpta ; regione umbilicali eburneâ : apertura transversa, sub-rhombea ; columellâ brevi, acutâ, contortâ. Lat. $\frac{9}{10}$, alt. $\frac{9}{10}$ poll. *Hab.* Madagascar ?

In form and sculpture this may be compared with the tip of *T. pica*. The peculiar coloration, representing courses of olive-colored stitches is characteristic.

Trochus spurcus. Testa parva, solida, globoso-conica, nitida, ubique striis volventibus exilibus insculpta, obliquè strigis angulatis stramineis et fuscis alternantibus variegata, propè suturam maculis quadratis quoque picta: spira anfr. 4 – 5 ventricosis, ultimo subangulato ; suturâ impressâ : basis concavo-conica, im-

perforata vel arctè umbilicata: apertura perobliqua, circularis; columellâ arcuatâ; labro acuto, simplici; fauce submargaritacea. Diam. $\frac{3}{8}$, alt. $\frac{3}{10}$ poll. *Hab.* Madeira.

Has most of the characters of *T. Fermoni*, but is very much smaller, wants the peculiar channelled shoulder of the whorls, and the widely open umbilicus.

TROCHUS AMŒNUS. Testa parvula, depressa, globoso-conica, levis, nitida, fusca, punctis luteis ubique irrorata, et maculis piceis cum flavidis alternantibus ad suturam et ad peripheriam ornata: spira anfr. 4–5 convexis, ad suturam constrictis: basis convexa, imperforata, concentricè striata: apertura sub-circularis; regione columellari complanatâ, albâ; columellâ anticè dentiferâ; labro acuto, striato; fauce lividâ, margaritaceâ. Diam. $\frac{3}{10}$, alt. $\frac{2}{10}$ poll. *Hab.* Feejee Islands.

A pretty shell, allied to some of the Mediterranean species, like *T. Lessoni.* Its small size, minutely freckled surface, with the articulated bands of black and yellow, may mark it.

TROCHUS (Monodonta) COLUBRINUS. Testa depressa, conico-globosa, imperforata, olivacea maculis subquadratis hepaticis tessellata, sulcis inequalibus minimè profundis cincta: spira anfr. 5, planiusculis, ultimo ad peripheriam obtusè angulato: basis convexiuscula, regione centrali absque colorem: apertura semi-circularis, columellâ acutâ, anticè truncatâ et dentem mentiente; labro acuto, viridi; fauce submargaritacea. Diam. $\frac{7}{8}$, alt. $\frac{6}{8}$ poll. *Hab.* Madeira.

This shell has the form and texture of Tr. *umbilicaris.* It seems not to be an uncommon shell, but I find no description of it.

TROCHUS (Monodonta) INSTRICTUS. Testa parva, elevata, ovato-conica, arctè perforata, albida et maculis dilutè rufis propè suturam picta: spira anfr. 5, convexiusculis, sub-imbricatis, suturâ profundâ canaliformi sejunctis, liris acutis ubique cinctis, interspatiis concinnè clathratis: basis convexa: apertura obliquè semicircularis; columellâ acutâ, obliquâ, in dentem terminante; labro incrassato, intus sulcato, juxta columellam rugoso et emarginato. Long. $\frac{3}{8}$, lat. $\frac{3}{10}$ poll. *Hab.* Pacific Islands.

TROCHUS (Monodonta) ATROPURPUREUS. Testa parva, depressa,

ovato-conica, atropurpurea, liris granulosis ubique cincta: spira anfr. 5 – 6, ultimo subangulato: basis convexiuscula, latè perforata; umbilico cavernoso, limine acuto, denticulato, propè columellam interrupto: apertura circularis; columellâ obliquâ, acutâ, anticè dentatâ, emarginatâ; labro albo et nigro articulato, intùs sulcato; fauce margaritaceo. Alt. $\frac{2}{10}$, lat. $\frac{3}{10}$ poll. *Habitat*, Tutuilla, Navigator Islands.

Allied to T. *pharaonis* and T. *canaliculata*, in its habitus and umbilicus, but more like T. *corallinus* in size and general characters. Its uniform color and granulation, toothed margin of the umbilic, with the conspicuous tooth above, are its characters.

Trochus (Monodonta) rotellinus. Testa parva, solida, lenticularis, nitida, fissurâ latebrosâ perforata, dilutè incarnata, flammulis flexuosis saturatioribus, et seriebus duobus transversis macularum fuscarum variegata: spira anfr. 5, convexiusculis: apertura parva, subcircularis; columellâ perobliquâ, arcuatâ posticè ab anfractu sejunctâ, anticè in dentem acutum terminante; labro propè dentem quasi emarginato. Diam. $\frac{3}{8}$, alt. $\frac{1}{5}$ poll. *Hab.* Mangsi Island.

This curious little shell would at first be taken by its form, polish, and color, for a *Rotella*, while the notch of the aperture resembles that of *Buccinum neriteum.* But its umbilic and columella place it with *Monodonta*, or more properly in that subdivision of *Trochus* named *Clanculus* by Montfort.

Mr. Desor addressed the Society upon the subject of the distribution of animal life among the Shoals of Nantucket. At a former meeting he had given descriptions of the various species found in this locality, and he now proposed to consider the law of their distribution.

The Shoals off Sancati Head, he said, might be regarded as a vast sub-marine plateau, with a depth of water upon it, at no place greater than twenty-five fathoms. Its surface rises into four principal ridges, which approach the surface of the water at different places to within fifteen, ten, six feet, or even one foot. The varying depth of water between these ridges gives rise to four principal horizontal divisions, marked by the absence or the distinct characters of animal forms.

The first division takes in the top of these ridges, and extends horizontally to various distances, according to the configuration of the Shoal. It is composed of sand, mostly quartzose, containing very little Feldspar, with some grains of Hornblende very much worn, but no animals. This sand, although very fine, is remarkable for its almost stony hardness. It has been a question to what this should be attributed. Some have thought that it may be owing to a cement combined with it, but on being dried it is found to lose its compactness. Mr. Desor stated it to be the opinion of Lieut. Davis, of the U. S. Coast Surveying service, that it is produced by the hammering action of the waves.

From the second division, which is directly below this, the dredge brings up nothing but broken shells, exhibiting marks of the powerful action of the sea. It is the opinion of Lieut. Davis, that those species in this division, which have not come from the deeper water at the base of the sand ridges, are brought from the neighboring shore by the tides; but as yet this needs confirmation. This division extends to a vertical depth of from three to five fathoms.

The third division, next below the second, contains pebbles, a few barnacles, and some species of *Membranipora.*

The fourth division, at the bottom of the interval between the ridges, abounds in animal forms. Every stone is entirely covered with corals or barnacles. It is worth remarking that the species here existing are not peculiar to this place, but are found under other conditions nearer the surface of the water. Thus, the *Natica heros*, found on Nantucket Shoals at a depth of from ten to fifteen fathoms, may be obtained on Chelsea Beach. The common Star-fish, found at the depth of twenty-five fathoms on Nantucket Shoals, exists at Beverly in shallow water. Other species, as *Cardita borealis*, for instance, species of *Buccinum* and *Astarte*, are subject to similar conditions of distribution. These facts are at variance with the opinion entertained by some, that each marine species has its district at a fixed depth below the surface. It may be true of some, however, which are found in brackish or fresh water. The pressure of the water prevents the existence of animals at a very great depth. The beating of the waves, on the other hand, limits their range upwards. On Nantucket Shoals this is very powerful, and is supposed by Lieut.

Davis, to be felt to the depth of perhaps ten fathoms. In sheltered harbors, such as Massachusetts Bay affords, species which on the Shoals are compelled to live at the bottom of the trenches, can find protection at the depth of a few feet. The fact that specimens obtained from the deepest water on the Shoals are entirely covered with delicate corals, proves the entire quietness of the water.

Dr. Bacon exhibited the specimen of Quartz crystals having on their surfaces dendritic oxide of manganese, which he had mentioned at the last meeting. He also announced the donation of about one hundred and twenty minerals from Messrs J. E. and E. C. Cabot; also, a third instalment of minerals from Mr. Alger, making in all nearly two hundred specimens selected from his cabinet.

Dr. Bacon likewise presented in the name of Mr. C. J. F. Binney, a curious specimen, consisting of silver dollars and a grape shot, incrusted with a calcareous deposit. It was taken from the wreck of the Spanish Frigate San Pedro, which was lost forty or fifty years ago, in the Caribbean Sea.

Dr. Cabot exhibited to the Society fifty-six birds, ready to be put into the cases. Most of them were from Mexico, and new to the Society's collection. The remainder were from Mr. Gassett's donation.

A fine specimen of Coral, from Bermuda, presented by Mr. T. G. Appleton, was laid on the table. The thanks of the Society were voted for the donation.

Messrs. F. Freeman, John K. Manley, and E. W. Dana, all of Boston, were elected members.

Dr. Leo Lesquereux, of Columbus, Ohio, was elected Corresponding Member.

February 7, 1849.

The President in the Chair.

Present, twenty-nine members. Mr. J. W. Foster, of Ohio, present by invitation.

The President exhibited to the Society the various specimens of teeth of the Asiatic and Indian Elephants, and *Elephas primigenius,* belonging to its collection, and demonstrated the distinctive structure of each. He recurred to the opinion expressed by him at a former meeting, of the probable identity of the South American mastodon with the *M. angustidens*, although this is at variance with the facts usually observed in the geographical distribution of animals, and stated that this opinion was sanctioned by the warrant of Cuvier, Owen, and Darwin.

The question of the geological position of the Mastodon giganteus was, he said, one of great importance. Dr. R. W. Gibbes of Columbia, S. C., who had made it a subject of some study, had been inclined at first to refer the remains of this species found near Charleston, S. C., to the *miocene;* but more recently had referred them to the *pleiocene*, guided by the character of the shells found with them. In reply to a question from Prof. Rogers, the President stated that the remains of two mastodons had been found in the north-east section of this country. One of them was obtained in Connecticut, about midway between the Connecticut river and the Hudson, casts of the bones of which may be seen in the Collection at New Haven.

Mr. Foster spoke of the position of the mastodon remains in Ohio. The general contour of the eastern part of that State, he said, was rounded and undulating, the highest ground being about six hundred and fifty feet above Lake Erie. Towards the west it assumes the character of a nearly uniform, level plain, which he considered as a subaqueous or lacustrine deposit. It consists of layers of regularly stratified clay of a very fine character.

Beneath is a thick, uniform stratum of blue clay; over it an equally regular stratum of yellow clay, on the surface of which are found boulders of native copper and granite. Remains of Mastodon, fossil Elephant, and Castoroides are found in the blue clay, and in erosions in the yellow filled with fresh water marl. Such is their position at Big Bone Lick, the great charnel house of these remains. At this place a small creek traverses a narrow valley of three-quarters of a mile in width, and empties into the Ohio. The swamp is filled in with blue clay, and on the adjacent banks the yellow clay is visible. The presence of the bones in the blue clay, which underlies the yellow, led him to consider this valley as one of denudation. The face of the country he thought had undergone no very great change since they were buried. If we suppose the Ohio to have been dammed up by a barrier five hundred feet high, all the level part of the State and the adjoining country would be an immense lake, the tranquil deposition from which, would account for the extensive clay formation. Some idea of its extent might be obtained from the fact that it had been traced over 8° lat., and that at Detroit its thickness is one hundred and ten feet. The position of their remains in this clay would give to these animals a very high antiquity, long anterior to man. He thought there was evidence of the existence of such an extensive lake at a former epoch, in the terraces and other geographical features of the country. Its northern part would border on a region which three quarters of the year would be one of ice and snow. This would explain the presence of the boulders in the South, which must have come from this district, as it would admit of the supposition of the transporting agency of icebergs, by which he had no doubt they had been brought down. The geographical features of the country excluded all possibility, he thought, of the action of glaciers. It seemed to him impossible that they could have traversed a nearly level plain, for a distance of six hundred miles. Neither was he inclined to believe in the power of water as a transporting agent in the present case. It is difficult to believe, he said, that water could have brought such masses of native copper a distance of sixty miles. Had such a power been in action, the largest and heaviest boulders would have been dropped first. But it is found that at the most southern limit of their distribution their size is as great as near their source. They are found deposited according to the configuration of the country.

Prof. Rogers said he wished to recur to his question as to the epoch of the mastodons. He had been long seeking light upon this subject. There was no doubt that in many places the remains of this animal had been found above the drift, in basins on its surface. They had been said to have been also discovered under the drift. It was out of all analogy to suppose that the race had existed at different dates at different places. How then were these discrepancies to be explained? He thought the facts of the case demanded a more thorough investigation. He had supposed that at Big Bone Lick the bones had been found in a drift formation. He would ask Mr. Foster whether at that place there was the same continuous boulder stratum as on the upland?

Mr. Foster replied that where the strata of clay had been cut through, the superincumbent boulders had dropped down into the valley, and rested on the clay imbedding the bones. The southern limit of the boulders, he said, was about lat. 40°. Very few are found south of the Ohio. They rest on the yellow clay.

Prof. Rogers said he thought there was the same room for doubt as to the age of the bones in question as in the case of the human remains found at Natchez, of which an account had been given by Dr. Dickerson. In a valley of denudation the deposit at the bottom may have been swept over into it, and be in reality composed of more recent materials than the higher formations in its vicinity, as was shown in the Mississippi case. He was still inclined to doubt the extensive character ascribed to the blue clay of Ohio, by Mr. Foster, and the consequent inference of the high antiquity of the relics entombed in it. He could not resist the impression that this deposit would prove to be a local one, thrown down by a circumscribed body of water. There had been so much doubt as to the age of the specimens from Carolina when presented at Philadelphia, that he had felt himself warranted in asking of Dr. Gibbes specific evidence as to the actual material from which, and from under which they were dug out. He said that he must dissent from Mr. Foster and Mr. Desor, as to their theories of the drift. He was no glacialist in any way. He could see no evidence, except in the ancient estuaries of the eastern part of the country, of an extensive sea four or five hundred feet deep, across which icebergs might have floated.

Dr. Pickering stated that Mr. Nuttall had obtained a large number of bones from the vicinity of the Neuss. Mr. N. had never attributed to them an age equal to the Tertiary. In the neighborhood of Big Bone Lick and the whole valley of the Ohio, there are no marine shells later than the Secondary. The same was true, he said, of the deposites in which mastodons had been found in New Jersey and New York.

Prof. Rogers remarked that he thought we should not assume the age of a formation without organic remains to prove it. He was glad he had it on Dr. Pickering's authority, that there are no marine fossils in the interior, associated with the remains in question. It was a point on which he had himself insisted for years. It was certainly very strange, if such an extensive submergence had existed, that no trace of animal life could be detected, even by the microscope. In the absence of such evidence he thought we must resort to the theory of inundation to explain the marks of aqueous action over so large a district, so near its present level.

Dr. Pickering said that he had asked Mr. Nuttall, if among the bones which he had collected from various localities, he had discovered any fossil shells ; and it was his impression that he replied, he had not. Dr. Pickering also stated that the region from which Dr. Gibbes obtained his specimens, is strictly an alluvial district, made up of mixed materials ; and that no dependence should be placed on the shells there discovered as indications of the age of the bones buried in it. He himself had seen a specimen of a Helix now living, found in this deposit.

The President remarked that Mr. Conrad held the opinion that the formation on the Neuss containing the fossils in question, belonged to the Medial Tertiary or Older Pleiocene deposit.

Mr. Foster stated that several years since, when engaged on the geological survey of Ohio, in the eastern part of the State, a number of mastodon and other bones were discovered, projecting from a bank of clay forty feet in thickness, over which was a heavy growth of trees, at a place where a creek had cut through the stratum and partially exposed them to view. By digging in horizontally many bones were obtained. The material in which they were imbedded was exceedingly fine. With the exception of a layer of about two inches in thickness it contained no rock of a size larger than a buck-shot. He would ask Prof. Rogers how it was possible that such a deposit could be formed in a state of things requiring a violent transportation of such boulders as lay above it. One would naturally suppose that the bones and boulders and materials would be mixed together, if this view were correct. On the other hand, he said, he saw evidence in the ridges and other features of the country, of an upheaval subsequent to the deposition of the clay. The most recent deposit in which mastodon remains had been found, was in Crawford Co., where a perfect cranium had been discovered in an erosion of the clay filled with fresh water marl. There were no shells found with it, only leaves.

Mr. Desor made some remarks in relation to a point to which Prof. Rogers attached much importance as evidence against the plausibility of Mr. Foster's and his own views, viz., the want of marine remains in the deposite under discussion. In a recent exploration of Tuckanuck shoal, near Nantucket, in an area of twelve square miles, with a nearly uniform depth over the whole surface, he had found, he said, not a single trace of shells at a depth of about five fathoms. They could only be obtained from the deep valleys intersecting the shoal, as explained at the last meeting. On the coast of Texas, where similar flats exist, so far as he had heard, the same barrenness prevails. Prof. Rogers considered it strange, that in so wide a country as North America there were no traces of marine remains to prove the existence of such an extensive submergence; for this submergence must have been very extensive, as specimens of *Tellina gröenlandica* had been found near Montreal, at an elevation of five hundred and forty feet above the present sea-level. If the water stood at this height, there were very few points in the north-eastern and western part of the country which could have been above the surface. That marine shells had not been found in the interior was no evidence that such would not be found. He would remind Prof. Rogers that two years since it was thought there were no fossils in the drift south of Lake Champlain and Portsmouth. Since then they had been obtained at Nantucket and at Brooklyn.

Prof. Rogers replied that he considered these remains evidence of the former existence of an extensive strait, which cut off New England from the main continent. He would ask Mr. Foster, if any bones had been found in Ohio except at such localities as Big Bone Lick.

Mr. Foster replied, that in sinking wells in different parts of the State, the same layers of clay had been found. Bones had also been obtained at a distance from Big Bone Lick, in the blue clay.

Dr. Pickering said he wished to recall the attention of the Society to the original subject, the mastodon. It was well known, he said, that the remains of this animal and kindred species had been found in high northern latitudes, entirely unsuited now by their climate and vegetable products, to their structure and habits. An opinion had been advanced, that since the epoch of these species the earth's equator had shifted.

It would aid us in considering the subject of the distribution of these animals, if we were to suppose, as some had done, that since the epoch of their existence the earth's equator had shifted. On referring to a globe it might be seen that, if the zenith were made to pass through London or Paris, the equator would just cut off the extremity of South America, so that nearly all the land would be in one hemisphere, and the water in the other. In this view the land would have more the appearance of one continuous territory, allowing a free migration from one part to another, than it has in the common way of regarding it.

Prof. Rogers, in reply to Mr. Desor's deduction from the barrenness of Tuckanuck shoal, said that he thought the examination had not been thorough enough to furnish an argument for the condition of a wide continent. The *Tellina gröenlandica* had been found by Mr. Lyell at Montreal, it was true, at an elevation of five hundred and forty feet, but at Augusta marine shells had been found at a height of seventy feet, near Quebec at eighty or ninety feet, and on Lake Champlain at a different level still. These facts indicated a want of that parallelism of level which

Messrs. Foster's and Desor's theories would require. On the other hand, the shells discovered by Mr. Lyell near Montreal were much broken and worn, and had evidently, he thought, been swept up from below and lodged in angles and depressions. Prof. Rogers also stated that in studying the geology of Pennsylvania during a period of ten years, he had found no marine fossils in the drift.

Mr. Desor remarked that Prof. Rogers's theory would not account for the regularly stratified ridges of six hundred, seven hundred, and nine hundred feet in height found in Ohio, which were probably at various periods the shores of vast collections of water.

Dr. Bacon announced the donation from Prof. J. W. Webster of five specimens of *Idocrase*, from Sanford, Me., the new locality of this mineral discovered by him last summer. From Francis Alger, Esq., two specimens of oxide of Tin from Cornwall, two of the rare mineral Muriophosphate of Lead from Keswick, Cumberland, and one of Phosphate of Lead from the same locality.

Mr. Joseph W. Balch and Dr. Geo. A. Bethune were elected members of the Society.

February 21, 1849.

The President in the Chair.

Present, fourteen members.

Dr. Gould stated a fact bearing upon the question discussed at the last meeting, as to the nature of the Ohio clay formation containing the mastodon bones. Up to the time of Mr. Lyell's visit to that State, geologists had supposed and asserted that no shells existed in that deposit. Mr. L. however, succeeded in finding at Big Bone Lick six or seven fossil shells, all fresh water species, imbedded in company with the bones.

Dr. Gould presented the following descriptions of new species of shells, brought home by the U. S. Exploring Expedition :

TROCHUS TANTILLUS. Testa minuta, conico-discoidea, flavido-cinerea, lineis radiantibus flexuosis fuscis picta: spira depressa, anfr. 4 – 5 angulatis, ultimo ad peripheriam dilatato, acuto: basis convexiuscula, perforata, flavida, liris duabus concentricis proclivibus munita: apertura obliquissima. Axis $\frac{1}{12}$, diam. $\frac{1}{8}$ poll. *Hab.* Sandwich Islands.

I have met with no description of a species so small as this, and yet its characters are very prominent. Its form and concentric ridges give it the aspect of a conical operculum.

PLANAXIS LINEOLATUS. Testa minuta, solida, acuto-conica, ex albido fuscescens, lineis castaneis numerosis cincta: spira acuta, anfr. 6 – 8 planulatis, supernis granulatis, ultimo $\frac{2}{3}$ testæ longitud. æquante, ad peripheriam sub-angulato: basis spiraliter striata: apertura rotundato-ovata, posticè haud callifera; labro pallido, vel fusco tessellato, intus denticulato; fauce fusco. Axis $\frac{1}{4}$, diam. $\frac{1}{8}$ poll. *Hab.* Wilson's Island.

This little shell is not infrequent in cabinets, but I find no description of it.

PYRAMIDELLA AMBIGUA. Testa minuta, albida, imperforata, ovato-subulata, costis longitudinalibus exilibus ad 20 ornata, intervallis spiraliter striatis : spira acuta, anfr. ad 10 planulatis : apertura auriculata, anticè subeffusa ; columellâ callosâ, gibbosâ, anticè sinuatâ ; labro simplici, incrassato. Axis $\frac{1}{4}$; diam. $\frac{1}{10}$ poll. *Hab.* Clermont Tonnere Island.

The characters of this little shell, which I have for the present placed under *Pyramidella*, are somewhat abnormal. Its size and sculpture would suggest *Truncatella ;* its aperture is somewhat like the effuse form of *Eulima ;* the form of aperture is also like *Pyramidella*, though it has no proper plaits, but merely an intrusion of callus with an adjacent sinus in place of them, and in this, is like *Monotigma.*

CERITHIUM (Potamis) SACRATUM. Testa rudis, elongata, badia et fasciâ luteâ cincta: spira turrita, anfr. ad 10 convexis, vix angulatis, et liris obsoletis cinctis, supernis plicatis, ultimo globoso, abnormali, varice magno munito; suturâ profundâ, luteâ: apertura rotundata, antice effusa, haud emarginata; labro everso, polito, piceo: operculum multispirale. Long. $1\frac{1}{2}$; lat. $\frac{5}{8}$ poll. *Hab.* Sacramento River, California.

Allied to *C. varicosum*, Sowb. The surface, though not smooth, is destitute of longitudinal ribs except near the tip; it has also a pale sutural region and a less marked canal.

CERITHIUM ADUNCUM. Testa solida, distorta, acuminato-conica, leviuscula, filis tenuibus cincta, luteo-cinerea, fusco-tincta: spira acuminata, anfr. 9 planis, suturâ vix discretis, ultimo gibboso, valdè deflecto: apertura angusta, callosa, in canalem adscendentem producta; labro crasso, simplici; fauce livido. Long. 1; lat. $\frac{2}{5}$ poll. *Hab.* Mindanao.

This smooth, solid, dusky species is plainly marked by its peculiarly distorted form, the last whorl being so flexed upon the others that its ventral outline is straight, while the dorsal outline is remarkably arched.

CERITHIUM IRRORATUM. Testa ovato-conica, transversim striolata, fusco-nigricans, punctis elongatis cinereis irrorata: spira conica, anfr. 7, planulatis, longitudinaliter undulatis, ultimo dimidiam testæ superante; suturâ obsoletâ: apertura rotundato-elliptica; labro declivi; canali brevissimo; fauce livido, albofasciato. Long. $\frac{3}{4}$; lat. $\frac{4}{5}$ poll. *Hab.* ?

Generally resembling *C. ocellatum*, Lam., which has a median tuberculated angle on each whorl and an excavated sutural region, while this has a regularly curved outline and folded surface. The pale spots are less numerous, and the proportions of the aperture are different.

CERITHIUM SORDIDULUM. Testa elongata, rubiginoso-albida, costellis numerosis et filis volventibus alternatim majoribus reticulata: spira turrita, acuminata, anfr. 11 planulatis, ultimo varicoso, granuloso; suturâ profundâ: apertura ampla, ovato-rotundata; labro crenulato, extus incrassato, rufo-tincto; rostro attenuato, valdè recurvo; fauce alba. Long. $\frac{7}{10}$ lat. $\frac{1}{4}$ poll. *Hab.* ?

In its general structure, especially in the development of the last whorl, this may be compared with *C. columna*, Sowb., but it differs entirely in sculpture, its beak is very much shorter, and it is very much smaller.

CERITHIUM INVAGINATUM. Testa elongato-turrita, sordidè alba, ad apicem et interdum ad rostrum rufescens, filis tenuibus cincta; spira anfr. 10–12 angulato-convexis, supernè tabulatis, infernè constrictis, nodoso-plicatis et concinnè lamelloso-rugosis, ultimo carinato: apertura subquadrata, alba; rostro gracili, recurvato. Long. $\frac{7}{8}$, lat. $\frac{1}{4}$ poll. *Hab.* Feejee Islands.

A very peculiar species. The tuberose whorls narrowed anteriorly, so as to appear when viewed from above as if crowded into each other, and the very delicate wrinkling of their superior portion renders their diagnosis clear.

CERITHIUM CÆLATUM, Couthouy MS. Testa subulato-turrita, dilutè rufa: spira anfr. ad 13 vix convexis, longitudinaliter crebrè sulcatis, et lineis duabus impressis cinctis, ultimo anfr. ad basim inornato; suturâ impressâ: apertura rotundata; columellâ arcuatâ, rostro brevissimo. Long. $\frac{3}{4}$; lat. $\frac{1}{5}$ poll. *Hab.* Terra del Fuego.

This species belongs to the same group as *C. turritella*, which it resembles; but in its delicate form it still more strongly resembles *C. sardoum*, Cantr.

CERITHIUM FILOSUM. Testa parva, elongato-turrita: spira anfr. ad 8 planulatis, sulcis et liris alternantibus æqualibus ad 4 cinctis, et coloribus cinereis et pallidé rufis partitis; suturâ impressâ: apertura parva, semi-elliptica, anticè emarginata; columellâ vix arcuatâ; labro acuto. Long. $\frac{5}{8}$, lat. $\frac{1}{5}$ poll. *Hab.* Puget Sound.

Only a single specimen of this turritella-like *Cerithium* has been examined. It is of the same type as *C. cælatum*, and is well characterized by its simple revolving lines and grooves, and its coloration.

CERITHIUM PUSILLUM. Testa minuta, fulva, turrita, varicosa, longitudinaliter undata, undis ad 10 propè basim evanescentibus: spira acuminata, anfr. 8 convexis, filis tenuibus granulosis 4 cinctis, anfractu ultimo multicincto: apertura lata, ovata, obliqua; rostro brevissimo; labro varicoso; columellâ arcuatâ. Long. $\frac{1}{5}$, lat. $\frac{1}{12}$ poll. *Hab.* Sandwich Islands.

A little shell about the size, and with many of the characters of *C. Emersonii.* It also resembles *C. ferrugineum*, Say, but is much smaller.

Cerithium egenum. Testa minuta, lanceolata, albida, ad basim maculis parvis fuscis notata : spira acuminata, anfr. ad 10 convexiusculis, filis ad 5 cinctis, quorum centrali et suturali majoribus, anfractu ultimo utrinque varicoso: apertura rotundato-ovalis; rostro brevissimo; columellâ posticè callosâ. Long. $\frac{3}{8}$, lat. $\frac{1}{8}$ poll. *Hab.* Wilson's Island.

The characters of this little shell are somewhat negative, but on the whole it may be distinguished by its sharp revolving lines having a tendency to granulation, without longitudinal folds; the little blotches in the region of the rostrum seem to be constant. It is a little like *C. lacteum*, but much smaller.

Cerithium ianthinum. Testa parva, tenuis, ovato-lanceolata, violacescens sed labro suturâ et varicibus albis: spira acuminata, anfr. trivaricosis ad 10, filis tenuibus ad 8 cinctis, quorum mediani majori et granoso ad anfractus apicales: apertura ovato-rotundata; rostro brevissimo; columellâ vix callosâ. Long. $\frac{3}{8}$, lat. $\frac{3}{20}$ poll. *Hab.* Clermont Tonnere.

If this be not the young of some other species, which I somewhat suspect, it is very well marked by its color alone. The contrasting of the white and violet, and its numerous ribs being beautifully displayed. It is larger than *C. ?* *?*.

Mr. Ayres exhibited the skull of a fish, showing a curious malformation. The anterior sphenoid bone was disarticulated, and turned up into the orbit of the eye, causing a displacement of the temporal and maxillary bones. Mr. A. remarked that it was a curious fact, that the only two instances in which he had found this malformation were species of the genus Labrax; *L. lineatus* and *mucronatus.*

A circular from the Smithsonian Institute relative to an extensive system of meteorological observations, and asking coöperation by Societies and individuals, was read by the Secretary. It was laid on the table to be at the disposal of any one who might wish to undertake the duty.

March 7, 1849.

The President in the Chair.

Present, twenty-five members.

Dr. C. T. Jackson exhibited to the Society specimens of gold ore from the Virginia mines, containing the raré mineral *Tellurium* in the form of a Telluret of lead and gold with a little silver, and a small amount of *Silenium.* These minerals, *Tellurium* and *Silenium* have never before been found in America. With some of the specimens Bismuth is found, a rare combination. The form, however, in which the ore is brought from the mines makes it difficult to say whether it is actually combined or only mixed with it.

Dr. Jackson presented, in the name of Elie de Beaumont, a monograph, entitled " Note sur les Systemes de Montagnes les plus anciens de l'Europe, par M. L. Elie de Beaumont, and gave a general account of its contents.

Prof. Rogers said he wished to present for the consideration of the Society some views of his own with reference to a certain peculiarity in the structure of Glaciers as he saw them in Switzerland, which had not been before explained.

The general structure of Glaciers, as has been pointed out by Agassiz, Forbes and others, is looped ; presenting a series of concentric curves bulging downwards, extending across the Glacier. Agassiz has determined that the middle of the Glacier moves the fastest, and has shown that these loops are caused by the closing up of fissures. The ice in fact presents in a fixed shape the conditions impressed on a current of water. Prof. Rogers said there was another looped structure, not so readily explained, which had come under his notice. About the end and on the edges of the Glacier the ice is in a condition of cleavage very much like that seen in a slate quarry. This appearance is due to a series of thin plates or layers which lie like a series of troughs, one within the other, in a direction almost parallel to the enclosing walls and end of the glacier. They are of such thinness that it is not uncommon to find three or four of them in the width of an inch. This structure is not due to the cause which produces the transverse loops, or any mechanical cause, but in Prof. Rogers's opinion, to a true molecular action in the substance of the ice. He said that he had before advanced the opinion that all cleavage in rocks is parallel to the planes of the highest temperature. He had been greatly interested in finding a precisely similar structure in glaciers under the same conditions. Prof. Rogers, with a view to an explanation of the phenomenon in question, stated a fact observed in ice held for a long time at a point just below melting. A block of clear ice kept for some time at this degree of temperature loses its transparency and cohesiveness, and on being struck falls to pieces in a number of perpendicular, thin, columnar fragments. The shape of these pieces is not due, he said, to the enlarging and running together of a number of air bubbles, but it is a true acicular, crystalline structure. The opacity of the ice he considered evidence of a change in the arrangement of its particles. He thought it possible that the laminated structure of the glacier of which he was speaking might arise from a similar cause.

Dr. Jackson said he was inclined to attribute the appearances in question to the action of air bubbles. Water he said, contains two and one half per cent. of atmospheric air. Its presence renders ice vesicular. He had never found a piece of ice without air-bubbles, and it can only be obtained for experiments by exhausting the air from the water by boiling, and rapidly freezing it. As to the first looped structure spoken of by Prof. Rogers, he could not understand it if Agassiz's theory were true, namely, that glaciers move by the alternate freezing and thawing of water in their interstices. If such were the case, then the thin glaciers would move fastest, other things being equal. As the freezing and thawing are the greatest on the edges, then the motion must necessarily be the greatest on the edges, which is not the case. The thickest are found to move the fastest, even on very slightly inclined surfaces, because there is less resistance on the sides in proportion to the mass. Mr. Forbes had found that glaciers descend on themselves, as it were, and move fastest in the middle. If they moved by alternate thawing and freezing, since these processes occur most readily on the edges, the motion would be greatest there, and they would be depressed below the centre. He himself was inclined to the opinion of Mr. Desor, that glaciers are in the condition of a soft solid substance, like a mass of dough for instance, and descend principally by the force of gravity. Such a mass descending in a confined space would naturally take the bowed shape noticed in glaciers. He suggested that the laminated structure mentioned by Prof. Rogers, might be caused by the freezing of water which had run down the sides of the barrier mountains.

Dr. Gould read a note from Prof. J. W. Webster of Cambridge, presenting to the Society a number of medicinal plants from the interior of Paraguay. The thanks of the Society were voted for the donation.

Mr. Bouvè announced a donation from Mr. Theo. Lincoln of Dennisville, Me., of several impressions of *Fucoides* on sandstone. The thanks of the Society were voted to Mr. Lincoln.

Prof. Rogers presented various books from Mr. Doubleday, The Entomological Society of London, Mr. Spence, Mr. Tilton, and Mr. Adam White, for which see Quarterly List. Prof. Rogers announced that sets of casts of the Fossils in the British Museum had been made, and were to be obtained at the Museum at cost, it being the object of the Managers of the Institution to make its collection as extensively useful as possible.

March 21, 1849.

Dr. A. A. Gould in the Chair.

Present, sixteen members.

Mr. Desor, not having been present at the last meeting, introduced the subject then treated of by Prof. Rogers, namely, the ribbon structure of the ice in Glaciers.

This had not, he thought, been satisfactorily explained before. This was partly owing to a confusion in the minds of those who had discussed the question, between the transverse looped structure and the ribbon structure in question, which is longitudinal. The cause of the former of these was, he thought, pretty well understood. He agreed with Prof. Rogers as to the resemblance in the ribbon ice to narrow bands of slate. At the head of the Glacier, as had been pointed out by Charpentier and Agassiz, after successive freezings and thawings, this ribbon ice is formed, but the plates are not of such regularity and length as lower down. At a lower point their appearance is as Prof. Rogers described them. Sometimes for a mile in length they are perfectly straight and of uniform thickness. In some places fissures of a few inches depth are seen in this ice parallel to its course, suggesting the question, whether they indicate the cause of the phenomena, or are only the effects of melting. An objection to the supposition that these layers of ice are produced by water freezing in cracks of the glacier exists in the fact, that they extend across deep ravines, and preserve for so great a distance such a strict parallelism and regularity. On the whole, Mr. Desor said he was inclined towards Prof. Rogers's theory, that the ribbon structure is due to a true molecular change in the substance of the ice itself, although it is not as yet demonstrable.

Prof. Rogers said he was glad to hear from Mr. Desor such a confirmation of his own views. He was not before aware that the blue bands are more irregular and infrequent at the upper than at the lower part of the glacier. He regarded the fact as a strong one in favor of his theory ; for it was quite natural to suppose that this would be the case, since the ice at this point had not been exposed to the influence acting upon it long enough to produce the structure in question. He regarded Prof. Forbes's opinion that the ribbon ice is caused by a movement of the mass on itself, by which longitudinal fissures are formed, as unphilosophical; since it would suppose a cohesiveness among the particles, and a disposition to separate into planes parallel to its course, not in accordance with the laws of such a mass. The fissures spoken of by Mr. Desor he regarded as the effect of atmospheric erosion, like those in a slate quarry. The bands could not be caused by water freezing in cracks of the glacier, as such ice would be likely to have an irregular, crystalline arrangement, as is seen where cracks in pond ice have been closed up.

Dr. Jackson asked Mr. Desor if he knew M. Elie de Beaumont's opinions on the structure under consideration.

Mr. Desor replied that M. de Beaumont admitted the constant correlation between the fissures and the bands, and attributed the former to a shrinking in winter.

Dr. Jackson said it did not seem to him important that the fissures should penetrate the whole mass. The contraction would be the greatest on the sides where the glacier is the thinnest, and where these bands of ice are found.

Mr. Desor remarked that it had been ascertained that below a depth of about ten feet, the centigrade thermometer stands invariably at zero.

Dr. Jackson replied that he did not attach much importance to this fact, since if the surface were to contract, the fissure would extend downwards to a depth proportionate to the toughness of the ice, and on the sides this process would go on the easiest.

Prof. Rogers said, that if fissures, ultimately giving rise to the bands in question, were thus formed by radiation from the barrier mountains or the direct rays of the sun, they would necessarily occur on the side of the glacier most exposed to these influences, and in accordance with the direction of the glacier. This was not found to be the case. In fact, none of these mechanical views would account for the length, parallelism, thinness, and trough-like arrangement of the plates.

Dr. Jackson stated as a curious fact, that in the Pudding stone of Roxbury, fissures exist which pass through the pebbles as well as the matrix in which they are enclosed.

As the pebbles are much harder than the enclosing rock, it is difficult to explain this phenomenon. But in no instance, Dr. Jackson stated, is the pebble loosened and dropped from its bed by the opening of the fissure. In some cases it is broken into three pieces, one remaining imbedded in each face of the opening, and the third being locked between them. Dr. J. had observed the same thing in the Pudding-stone of Rhode Island. If these fissures had been produced by contraction of the rock, the pebbles should drop out. In conclusion, he suggested that an earthquake shock might have been the cause of the phenomenon.

Prof. Rogers said that he did not believe the appearances in question could be explained by earthquake movements, as the regular forms of the masses bounded by the fissures were at variance with the observed effects of these movements. Nor was he willing to admit any other mechanical cause as sufficient to account for them. He thought that this division was due to a similar cause to that producing slaty cleavage ; some corpuscular force ; a force generated at the place of action, and extending through the whole mass of matter, such as that arising from electric or magnetic attraction and repulsion.

Dr. Jackson thought that the heterogeneous character of the Pudding-stone precluded the possibility of accounting for the fissures by any general cause such as Prof. Rogers assigned for them, excepting heat. In reply to a question from Mr. Desor, he stated that the Pudding-stone belonged to a date anterior to the Coal.

Mr. Desor presented to the Society a new theory to explain the formation of fogs on banks and shoals, which he thought would also account for the formation of ground ice.

It is a well known fact that fogs are of very common occurrence over the shoal water of the Southern seas. Their outline is so definite, that according to an expression of Humboldt, they present themselves to the eye like air pictures, in which the fashion of the bottom is reflected. Dr. Franklin first noticed that the water in such places is colder than the surrounding sea. As to the cause of this difference of temperature there have been various opinions. None of them, however, seem to be satisfactory.

Mr. Desor then proceeded to unfold his own views as follows:

It is not, he said to foreign causes that we must look for an explanation of this phenomenon, but to the shoals themselves. The atmosphere over the water is cooled down by the abstraction of caloric, caused by the radiation through the water of heat from the bottom. The suspended moisture is consequently condensed in the form of fog. That such a radiation takes place is sufficiently evident from the formation of ice at the bottom of ponds and rivers, called *ground ice.* This sometimes accumulates in such a quantity, as when detached from the bottom to raise and bear off from their bed large stones and boulders. There is little doubt that the extensive ice fields found in the spring in the vicinity of the Grand Banks, and which Mr. Desor himself saw covering the sea for many miles, in March, 1847, are made up of ground ice which has floated to the surface. It will be seen that the agency of ground ice furnishes a means of solving many difficulties in the distribution of the drift, such as the transportation of those blocks and boulders which are found at a level higher than their source.

Mr. Burnett exhibited a series of drawings representing the progressive development of the eggs of a spider, of a species unknown to him. They were magnified to one hundred and sixty diameters. He stated that there was a difficulty in studying the embryonic development of the Arachnidæ, growing out of the opacity of the envelope of the egg, and the extreme delicacy and semi-transparency of the germ. By the application of acetic acid he succeeded in removing the horny envelope without injuring the vitelline membrane. Mr. Burnett's observations were found to coincide very exactly with Herold's.

Mr. Bouvé presented to the Society specimens of *Orthis testudinaria* from the blue limestone of the Ohio, *Leptœna sericea*, and *Favistella stellata* from the basin of the Ohio.

Dr. Bacon presented in the name of Mr. Francis Alger, sixty mineralogical specimens, mostly from New Jersey.

Mr. John Ayres of Boston, and Dr. Andrew Henderson of Chelsea, were elected members of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING MARCH 31.

Observations on Belemnites and other Fossil Remains of Cephalopoda. By G. A. Mantell. 4to. London, 1848. Pamph. *From the Author.*

Structure of the Maxillary and Dental Organs of the Iguanodon. By G. A. Mantell. 4to. Pamph. London, 1848. *From the Author.*

Stratigraphical Section from Atherfield Point to Black-Gang-Chine, on the Isle of Wight. By W. H. Fitton. 1 sheet, fol. London. *From the Author.*

American Journal of Science and the Arts. 2nd series, No. 19, for Jan. 1849. *Exchange.*

Plates 140 – 150, to the Viviparous Quadrupeds of North America. Folio. Also Title-page and Index to Vol. III. *Subscribers.*

Proceedings of the Academy of Natural Sciences. Pages 57 – 112. 8vo. Pamph. Phil. 1848. *From the Academy of Natural Sciences.*

Proceedings of the American Philosophical Society. Vol. V. No. 41, for Dec. 1848. *From the American Philosophical Society.*

Notes on the Medical Application of Electricity. By W. F. Channing, M. D. Boston, 1849. *From the Author.*

Bulletin de la Sociétè Geologique de France. 2ème Serie. Tome IV. Feuilles 63 – 73. Tome V. Feuilles 9 – 15. *From the Sociétè Geologique.*

Twelve Lectures on Comparative Embryology, by Louis Agassiz. 8vo. Pamph. Boston, 1849. *From A. A. Gould.*

Gelehrte Anzeiger herausgegeben von Mitgliedern der K. Bayerischen Akademie der Wissenschaften. Vols. 24, 25. 4to. München, 1847–8. *From the Munich Academy.*

Annals and Magazine of Natural History. No. XIII., for January, 1849. 8vo. London. 2d series. *Courtis Fund.*

Catalogue des Coléoptères de la Collection de M. Le Compte Dejean. Nos. 1–5. 8vo. Paris, 1833–4. *From Dr. T. W. Harris.*

Observationes quædam de Salamandris et Tritonibus. Auctore C. J. Ernest de Siebold. 4to. Pamph. Berolini, 1828. *From Dr. Joseph Leidy.*

Geographical Memoir upon Upper California in illustration of his Map of Oregon and California. By J. C. Fremont. 8vo. Pamph. Washington, 1849. *From Hon. R. C. Winthrop.*

Stratigraphical account of the section from Atherfield to Rock-en-end in the Isle of Wight. By W. H. Fitton. 8vo. London, 1847. *From the Author.*

Bulletin de la Société Geologique de France. 2ième serie. Tome IV. Feuilles 74–78, et Tome V. Feuilles 16–28. 8vo. Pamph. 1846–8. Paris. *From the Société Geologique.*

Second Annual Report of the Regents of the University on the Condition of the State Cabinet of Natural History. 8vo. Pamph. Albany, 1849. *From the Regents of the University.*

Note sur les Systèmes de Montagnes les plus anciens de l'Europe. 8vo. Pamph. Par M. L. Elie de Beaumont. *From the Author.*

List of specimens of Dipterous Insects in the British Museum. Part I. 12mo. Pamph. London, 1848. *From E. Doubleday.*

List of specimens of Lepidopterous Insects in the British Museum. Parts I. and II., and Appendix. 12mo. Pamph. London, 1844–8. *From E. Doubleday.*

Transactions of the Entomological Society of London. Vol. V. Parts 1, 4, 5. 8vo. Pamph. Lond. 1845–8. *From the Entomological Society.*

Zoölogy of the Voyage of H. M. S. Samarang. Edited by Arthur Adams. Mollusca. 4to. Pamph. Part I. By A. Adams and L. Reeve. London. *From Adam White.*

Annals and Magazine of Natural History. No. XIV. 2d series. February, 1849. *Courtis Fund.*

American Journal of Science and Arts. 2d series. No. 20, March, 1849. *Exchange.*

Verhandlungen der Russich-Kaiserlichen Mineralogischen Gesellschaft zu St. Petersburg. Jahr 1847. 8vo. Pamph. St. Petersburg, 1848. *From Charles Cramer.*

Address before the Entomological Society of London. By William Spence. 8vo. Pamph. London, 1848. *From the Entomological Society.*

Researches in Meteorology. By Bennett Dowler. 8vo. Pam. New Orleans, 1848. *From the Author.*

Review of Mr. Solly's book on the Brain. By B. Dowler. 8vo. Pamph. *From the Author.*

Researches on the Capillary circulation. 8vo. Pamph. By B. Dowler. New Orleans, 1849. *From the Author.*

Bulletin de la Société Géologique de France. 2ème serie. Tome VI. Feuilles 1 – 4 (6 – 20 Septembre, 1848.) *From the Sociétè Géologique.*

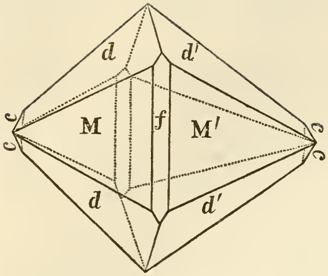
April 4, 1849.

The President in the Chair.

Present, twenty members.

Mr. J. E. Teschemacher read a paper giving the results of his measurement of the angles of the mineral recently described by Prof. C. U. Shepard as *Arkansite,* as follows:

Among some crystals of *Arkansite* kindly presented to me by Prof. C. U. Shepard, I found two or three with extremely brilliant planes, which enabled me to measure the angles with accuracy by the reflecting goniometer. I present herewith, a complete figure of the crystal, and the measurements of nearly all the planes. This has not hitherto been published.



M	on	M'	100
M	"	M'	80
M	"	d	133.35
d	"	d	135.45
c	"	c	124

Plane f too round to be measured.

Terminal planes P are entirely obliterated by modification d; on some crystals they exist, but are not sufficiently brilliant for accurate measurement.

The form, as correctly stated by Prof. Shepard, is a right rhombic prism, but it will be seen that this form as well as the values of the angles, are precisely those of Brookite. The qualitative analysis of *Arkansite* by Mr. J. D. Whitney, recently read before the Society, therefore leaves little doubt of its being this mineral, hitherto so extremely rare as to have only been analyzed by Prof. Rose of Berlin.

The specific gravity of the oxide of Titanium has been shown by this chemist in his elaborate paper, to vary according to circumstances. Of Rutile it is 4.25, of Anatase 3.85.

Shepard's specific gravity of Arkansite is 3.857. But this gentleman has published the result of his qualitative analysis of Arkansite, which he calls a Niobate of Yttria and Thorina. Now Thorina has a specific gravity of 9.00, being more than double that of the highest oxide of Titanium. The presumption is, that if Thorina formed an essential ingredient of Arkansite its specific gravity would be much higher than 3.857.

Mr. Whitney also states that its specific gravity, which he had ascertained to be 4.085, is sufficient proof that its composition could not be that of the Niobate in question.

The Arkansite of Prof. Shepard is therefore unquestionably identical with Brookite, and this country in another instance furnishes in abundance a very interesting mineral hitherto of too rare occurrence in Europe to reach the hands of the analyst.

Dr. C. T. Jackson laid before the Society the results of his observation of the comparative effects of the inhalation of nitrous oxide, and the vapor of chloroform and sulphuric ether.

Nitrous oxide, he said, administered in large doses, produces great excitement, which increases with the quantity inhaled. The vapor of chloroform, on the other hand, when inhaled rapidly, causes an immediate and entire prostration. The same is true in a less degree, of sulphuric ether. They do not produce the intoxication which is caused by nitrous oxide. This agent administered slowly, fails to produce the usual effects. In 1837–8 Dr. Jackson administered it to his pupils from a bag with a very small aperture, without in any instance succeeding in causing intoxication. The vapor of chloroform slowly inhaled has an injurious influence. It disorganizes the blood, and stops the circulation in the capillaries. When suddenly introduced it retards, but does not stop the circulation. Patients to whom it is slowly administered recover slowly. It is very important that enough air should be admitted with it. Persons inhaling nitrous oxide retain the sensibility to touch, and the respiratory action is quickened, increases and becomes deeper as the inhalation is prolonged. During the inhalation of chloroform and ether, on the contrary, the respiratory power diminishes. Under the influence of exhilarating gas the system is made very irritable. According to Davy it is not a suitable agent for producing insensibility in grave surgical operations. Dr. Jackson thought that the few cases of excitement after the inhalation of ether might be attributed to the previous state of mind of the patient, or to alcohol combined with it. Conclusions drawn from experiments upon animals with these agents should be received with great caution. Their action on animals differs according as they have or have not a cutaneous perspiration. It kills those of the latter class. Dr. Jackson recommended a mixture of chloroform with alcohol, in the proportion of an eighth or a quarter of an ounce of the former to four ounces of the latter.

The President remarked that from his own experience he preferred ether to chloroform, as being much safer. He alluded to the fatal cases that have been reported from the use of the former, and said it was not easy to explain this result. He preferred, in his own practice, chloric ether to either of the other anæsthetic agents.

Mr. Desor said that he had lately observed among the polyps which grow in the neighborhood of Boston, a species of the genus *Syncoryne*. The species comes nearest to *Syncoryne Listeri*, Van Beneden, from which it differs however, in being less branched.

As this polyp was covered with buds, Mr. Desor was induced to follow up its development, which led him to the result that these buds give rise to those little jelly-fishes, which are found in so great abundance about the wharves of Boston during the months of April and May, and which have been described under the name of *Oceania tubulosa*.

The formation and growth of these buds or embryos is very simple. A kind of hernia is formed in the outer membrane of the polyp. Into this the alimentary (sap-like) liquid, which circulates through the stem of the polyp, enters, eddies in it, as in a reservoir, and flows out again. As the bud grows the liquid is seen to penetrate into it in four other directions, and to form thus the four accessary channels which surround the central reservoir, and are easily recognizable by the same red color. At the summit of these four accessary tubes are then seen four black spots, which are the so-called eyes of the embryo Medusa. When the bud has reached the size of a large pin's-head, it extends from its interior four threads, being the prolongations of the four accessary channels, which become the four tentacles or nettling organs of the young Medusa. One day Mr. Desor and Mr. Cabot saw a large number of buds or embryos in this state, contracting violently, evidently in order to break the peduncle by which they were attached to the polyp stalk. This they succeeded in doing, and moved freely about in the water, like Medusæ. The central reservoir was then closed up at the top, where a navel was formed, and became the stomach of the Medusa; whilst a new opening appeared at its opposite extremity, which was the mouth.

Similar metamorphoses were some years since traced in different polyps, and several authors have pointed out the resemblance between these buds and some small Medusæ; but they have generally looked upon it as a mere analogy. Thus Loven considers them as the female polyps. Steenstrupp regards them as nurses; and he suggests the idea that many small Medusæ might prove to be nothing but nurses of polyps ; an idea which has since been repeated by others, but without any proof. Van Beneden, on the contrary, who has made the most extensive investigations in the development of these animals, asserts positively that there is no identity between these embryos of polyps and true Medusa ; that the resemblance is merely apparent and external, and that the bud, after being freed, fixes itself and becomes a new polyp. He has even drawn a hypothetical figure which is intended to show the manner in which this supposed transformation takes place in Tubularia. (See Mem. de l'Acad. de Bruxelles, Tom. 17.)

Mr. Desor's investigations show that the embryo of Syncoryne is neither a nurse nor a female polyp, but that it became really a genuine Medusa, (the *Oceania tubulosa*), which does not turn into a polyp, but which is found afterwards to have its ovary filled with eggs, which are laid, and probably produce in their turn young Syncoryne.

The two animals *Syncoryne* and *Oceania tubulosa*, widely different as they are in shape and structure, being thus proved to be the same animal, like the caterpillar and butterfly, they ought henceforth to be designated under one name. The rule in such cases generally is to retain the name of the perfect form. But as the *Oceania* in question does not agree exactly with the figure given by Ehrenberg, Mr. Desor proposes to adopt in this case the name of *Syncoryne.**

Mr. D. laid before the Society a series of drawings illustrating the above development.

Mr. Adams exhibited to the Society a daguerreotype view of a spider's claw as seen through a microscope. It was a very perfect representation of the object, and according to Mr. Adams, the first successful application of this process in this country to such a purpose.

Donations of books were announced, from Dr. R. W. Gibbes of Columbia, S. C., Hon. R. C. Winthrop, and from Mr. Isaac Lea of Philadelphia, for which see Quarterly List.

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* See note page 139.

A specimen of flexible sand-stone from the neighborhood of Agra, Hindostan, was presented in the name of Mr. W. S. Bullard.

Mr. Bouvé presented a fossil coral, from Trenton Falls, in the name of Mr. John Perry, Jr.

A number of insects well preserved in gum copal, were exhibited by Dr. Gould in the name of Thomas W. Taylor, of Salem.

Dr. Cabot announced the addition of the following birds to the Society's collection, and exhibited the specimens, viz.: *Mergus castor*, male, presented by himself; *Anas boschas*, received in exchange; *Artamus leucorhynchus*, from Mr. Gassett; *Anöus stolidus?* exchange; *Sylvia petechia*, adult and young male, *S. discolor*, male, *S. striata*, male and female, *S. parus*, *Anthus ludovicianus*, *Troglodytes hyemalis*, from John Bethune, Esq., a member of the Society; a male wild Turkey, *Meleagris gallopavo*, from Col. Jaques of Charlestown, Mass.; and a White-fronted Goose, male, *Anser erythropus*, shot at Quincy, Mass.

Capt. N. E. Atwood of Provincetown, Mass., presented a female Harlequin Duck, *Fuligula histronica.*

April 18, 1849.

The President in the Chair.

Present, twenty-four members.

Mr. Burnett read a paper on the power of resisting cold possessed by some of the lower animals.

He had come to the conclusion, by experiments on fish, leeches, spiders, &c., that although these animals might become quite stiff by exposure to extreme cold without losing their vitality, yet actual congelation of their tissues was fatal to them. In those cases in which it had been said that fish had been actually frozen and afterwards recovered their activity, he supposed that a low degree of action in the organs of circulation and respiration must have been still kept up.

Mr. Ayres stated that he had received during the winter a Cat-fish in a frozen state, which when thawed was found to be living. He had also had in his possession a species of *Limnæa* inclosed in ice without injury.

Mr. Desor gave an account of his recent investigations upon the development and transformation of the common Jelly-fish of Boston harbor, *Aurelia aurita,* Müll. as follows:

It is now ten years since M. Sars first astonished the scientific world by his discovery that the Medusæ undergo a series of transformations not less remarkable than those of insects. The brood when first hatched resemble *infusoria*, being covered with fine ciliæ, by means of which they swim about in the water. After some days they become fixed by one extremity, whilst at the opposite extremity those little processes appear, which by degrees are transformed into tentacles. Transverse folds are said to appear next, at regular distances on the body, the grooves between which, gradually deepen, and the folds become serrated on the edge, so that the whole mass takes the appearance of a pine cone. At last the fissures become so deep that the layers between them are united only by a very slender axis, so that they resemble a pile of saucers. At a later stage they disengage themselves from each other, and each division becomes a free Medusa.

Larva forms of the Medusa have, since their discovery, been observed only in Scotland by Sir John Dalyell, who made them the subject of an elaborate investigation. They had never been noticed on this side of the Atlantic. It was Mr. Desor's good fortune, in visiting in company with Dr. Bowditch one of the wharves of Boston, at the beginning of the present month, to find them attached in great numbers to the logs. They appeared to the naked eye, as small red dots, which might easily be mistaken for very young *Actiniæ*.

A number of these little bodies were kept for several days in jars, and were seen by Mr. Desor, as well as by Drs. Bowditch, Cabot, and Abbot, and several other persons, to contract violently until the different cups became detached from the mass and were seen swimming about as free Jelly-fishes, of the species hitherto known as *Ephyra.* The base remained and preserved its polyp-like form; being of a white and sometimes of a light orange color, whilst the bunch of young Medusæ was pink.

The observations of Mr. Desor confirm entirely the views taken by Sir John Dalyell, as to the nature of this basis or trunk of the larva, which is described by him under the name of *Hydra tuba.* It is a genuine polyp, bearing all the characters of the true Hydra, so that it seems difficult to separate it from that genus.

But this polyp by no means transforms itself into a Medusa, either entirely, as M. Sars supposes, or in part, as is supposed by Sir John Dalyell. It remains a genuine polyp during its whole life, and buds in a manner similar to that of *Syncoryne*, *Tubularia*, and other Polyps, but with the difference that the bud, instead of growing from the side or from the axis of the polyp, grows from within the circle of the tentacles, in the form of a red hernia, which soon elongates, becomes wrinkled transversely as it grows, and finally transforms itself into as many small Medusæ as there are transverse divisions of the bud.

The circumstance that this bud when fully developed is larger than the polyp itself, has probably prevented the above-mentioned eminent naturalists from understanding fully its true meaning; and led them to consider erroneously the whole process as a transformation or metamorphosis of the polyp itself, while it is really nothing but the growth of a bud out of the body of the polyp; which is found unaltered after it has fallen off, with just the same form and outline as before; just as the *Syncoryne* remains unaltered and continues its polyp life, when its offspring, the *Oceania*, has fallen off. [See Page 133.] Mr Desor said that neither he nor any of the gentlemen who watched these larvæ saw any indication of tentacles at the top of the bud. The tentacles of the polyp remained unaltered at the base of the bud, where one would expect to find them, as the bud grows from within, and seems to undergo no change either in form or size. Possibly the clefts or lobes of the topmost disc may have been mistaken for tentacles, as they are sometimes very slender and long; or else there must be in the European species some appendages of a peculiar kind, belonging to the bud, which do not exist in the Boston species.

According to a suggestion of Dr. T. W. Harris, the transverse divisions of the bud should be considered as indicating its progressive growth; and this view seems to be more in accordance with the mode of budding in other polyps, than if we consider the divisions as occurring after the bud has arrived at its full size.

Mr. Desor infers from his observations, that there is no real difference between the development of the common Jelly-fishes (*Aurelia*,) and that of the *Oceania* and other small Medusæ. The law of development is the same for all. They all originate from polyps by budding, and the division which some naturalists have proposed to establish between free Medusæ and fixed Medusæ proves thus to be without any foundation. It has been suggested that the whole classification of the Medusæ must in consequence of these new facts, undergo considerable modification, and most of the *Acalephæ* (at least all the *Discophori* or *Pulmonigrades*) should be united with the *Hydroidian polyps*, as bearing to them a similar relation to that which the butterfly bears to the caterpillar. On the other hand, as the common *Hydra* is so similar in structure to the polyp state of the common Medusa (*Hydra tuba*,) the question arises as to its real affinities, since it is not known to undergo any similar process of budding. Is *Hydra* therefore to be removed entirely from the other *Hydroidian polyps*, such as *Hydra tuba*, *Tubularia*, *Syncoryne*, &c., or does it undergo some similar processes which have heretofore escaped the attention of naturalists? This question will no doubt be soon decided. Meanwhile it ought to be remembered that Sir John Dalyell kept for several years numerous specimens of *Hydra tuba* under his eyes, before they began to produce *Medusæ*. Mr. Desor himself saw these buds only during a few days, in Boston harbor, and since that time he has not been able to find any.*

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* The observations of Mr. Desor on the development of Medusæ, give confirmation to the views already advanced with more or less accuracy by many naturalists. For a historical summary of the results obtained by different observers, see Dujardin, Annales des Sciences Naturelles, T. IV. p. 257, 1845; and for a general analysis of labors in the same department, see the Lectures on Compar-

The above facts and demonstrations were illustrated by a series of drawings laid before the Society.

Dr. Gould presented descriptions of the following species of shells from the Collection of the U. S. Exploring Expedition.

PLEUROTOMA SEMINIFERA. Testa subulato-turrita, fuscescens, filis deorsum crescentibus cincta: spira anfr. ad 12, juxta suturam carinatis, deinde excavatis, ad medium nodulis obliquis rubris ornatis: apertura angusta, $\frac{2}{3}$ long. testæ adequans; caudâ brevi; sinu æquè latâ ac profundâ; columellâ rectiuscula; fauce livido. Long. $1\frac{3}{8}$; lat. $\frac{3}{8}$ poll. *Hab.* ———.

Closely allied to *P. interrupta*, Lk., but differing from the figures in color, and from the description in having a more decidedly excavated girdle in front of the suture, in the greater obliquity of the folds, and in their not reaching to the suture below.

MANGELIA CITHARA. Testa parva, rhomboideo-fusiformis, cinerea, costis acutis longitudinalibus 7 instructa, interstitiis concavis, subtiliter transversim striatis: spira turrita, anfr. 7 benè discretis, ultimo ovatò-triangulari $\frac{2}{3}$ long. testæ adequante: apertura angusta, labro lato, varicoso, posticè rectangulari vix sinuato; columellâ concinnè rugosâ. Long. $\frac{3}{8}$; lat. $\frac{3}{20}$ poll. *Hab.* Feejee Islands.

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ative Embryology before the Lowell Institute, by Louis Agassiz, Professor in the Lawrence Scientific School, Harvard University—1849. Below are given references to the more important labors of those who have studied the metamorphoses of Medusæ.—*Publishing Committee.*

Dalyell, in the Edinburgh New Philosophical Journal, 1836.

Dalyell's Rare and Remarkable Animals of Scotland. London, 1847.

Siebold. Beitrage zur Naturgeschichte der Wirbellosen Thiere, 1839.

Sars' Fauna Littoralis Norvegicæ.

Sars. Annales des Sciences Naturelles, Tome XVI. 1841, p. 321. (Translated.)

Loven. Memoires de l'Academie de Stockholm, translated into Archives de Wiegmann, 1837, p. 249.

Nordmann. Comptes Rendus, de l'Academie des Sciences. 1839.

Van Beneden. Memoire sur les Campanulaires, 1843; and Recherches sur le embryologie des Tubulaires, 1844.

Du Jardin. Sur la Developpement des Medusés et des Polypes Hydraires. Annales des Sciences Naturelles, Tome IV. p. 257. 1845.

Agassiz. Twelve Lectures on Comparative Embryology, delivered before the Lowell Institute, December and January 1848-1849, p. 36 et seq.

Forbes' Medusæ of Great Britain.

Much like *M. Hornbeckii*, a West Indian species, but has a much narrower aperture, fewer ribs, and the last whorl shorter. *M. pessulata* has also many more ribs, and is much less acuminated anteriorly.

Fusus liratus, Couth. MS. Testa parva, solida, ovato-fusiformis, straminea, longitudinaliter plicis angularibus instructa et striis profundis cincta ; spira brevis, conica ; anfr. 7, ventricosis posticè angulatis, ultimo $\frac{3}{5}$ long. testæ adequante, antrorsum in rostrum tenuem, contortum subito contractum : apertura angusta, ovata, in canalem obducta ; columellâ politâ, contortâ, albâ. Long. $\frac{3}{4}$, lat. $\frac{3}{8}$ poll. Dredged at Orange Harbor.

The prominent trigonal ribs, cut by the deep, somewhat distant revolving lines, with its slender rostrum, are characteristic of this species. It resembles *Buccinum cancellarioides*, Reeve.

Fusus crispus, Couth. MS. Testa parva, subrhomboidea, elongata, rudis, cinerea, plicis laminosis 8 variciformibus e striis laxis incrementalibus compositis instructa, et liris obtusis cincta : spira acuto-conica, anfr. 7 – 8, convexis, posticè plus minusve angulatis, ultimo ventricoso, $\frac{2}{3}$ long. testæ adequante, antrorsum in rostrum acutum subitò attenuato : apertura rotundato-ovata, labro semicirculari, crenulato ; columellâ rectiusculâ. Long. $\frac{7}{8}$; lat. $\frac{9}{20}$ poll. Dredged at Orange Harbor.

This species, from its variciform plaits might be regarded as a *Murex*, were it not for its rostrum, and its animal. The form varies greatly, as well as the degree of angularity of the whorls ; but the peculiar lax arrangement of the stages of growth, especially where they form the varices, allows of no mistake.

Fusus incisus. Testa elongato-ovata, livido-cinerea, striis profundis volventibus saturatioribus incisa : spira conica, anfr. 7 convexis, apicalibus undulatis, ultimo $\frac{2}{3}$ long. testæ ; rostro brevi, vix recurvo : apertura $\frac{1}{2}$ long. testæ, angusta, subovalis ; labro arcuato, acuto, crenulato ; columellâ rectiusculâ, lævi, subcontortâ, purpurascente ; faux livido-fusca, sulcata. Long. $1\frac{3}{4}$; lat. $\frac{7}{8}$ poll. *Hab.* ———.

This buccinoid species should perhaps be grouped with the genus *Pollia* of Gray. It has no remarkable characters except its dingy livid brown color, and the deep cut revolving lines.

Fusus fidicula. Testa parva, tenuis, albida, longitudinaliter lamelloso-costata, costis 24, striis volventibus ad 8 decussatis :

spira conica, turrita; anfr. 7 tabulatis, ultimo in rostro brevi subitò attenuato: apertura angusta dimidiam long. testæ haud æquans, posticè angulata; labro acuto, crenulato; columellâ posticè arcuatâ, albâ, politâ. Long. $\frac{9}{20}$; lat. $\frac{9}{40}$ poll. *Hab.* Puget Sound.

The counterpart of *F. turricula*, from some varieties of which it would not at first be distinguished; but it is smaller, more solid, the longitudinal ribs more lamellar and more decidedly cut by the revolving lines, which are also less numerous.

Fusus orpheus. Testa parva, elongata, cinerea: spira turrita, anfr. 6 supernè angulatis, lamellis acutis longitudinalibus muricatis, et filis transversis cinctis; anfr. ultimo posticè ventricoso, antrorsum in rostrum vix reflexum attenuato: apertura elliptica, $\frac{1}{2}$ long. testæ, posticè angulata; labro acuto; columellâ anticè intrudente; fauce carnicolori. Long. $\frac{1}{2}$; lat. $\frac{1}{5}$ poll. *Hab.* Puget Sound.

More slender, the beak longer, the longitudinal bars less numerous and more lamellar than in *F. fidicula;* in form it is more like *F. bamffius.*

Fusus sublutus. Testa parva, tenuis, elongata, pallida vel ad basim et ad suturam livida, longitudinaliter costata, costis ad 12 erectis, obtusis, ad suturam haud attigentibus, sed secundum rostrum productis: spira acuto-conica, anfr. 7 – 8 convexis, apicalibus levibus, alteris minutissimè decussatis, ultimo sub-globoso $\frac{1}{2}$ testæ long. adequante: apertura angusta, posticè angulata; labro posticè arcuato; fauce castaneo, albo fasciato. Long. $\frac{2}{5}$; lat. $\frac{3}{12}$ poll. *Hab.* ———.

The last whorl and beak are unusually short, with much the aspect of a *Mangelia.* The coloring of the aperture is very decided, while the surface looks dead and chalky.

Triton brasilianum. Testa rhomboidea, elongata, rufescens, epidermide tenui longitudinaliter hic illic fimbriato induta: spira conico-turrita, anfr. 6, tabulatis, supernis costis quadratis duabus ad apicem granulatis cinctis; anfr. ultimo triangulari costis 6 undato-nodosis antrorsum diminuentibus cincto, in rostrum vix recurvum producto: apertura $\frac{1}{2}$ long. testæ ovato-lunata; labro valdè varicoso, costis supereuntibus, interspatiis fuscis, plicis geminatis albis munitis; columellâ castaneâ rugis albis obliquis ornatâ. Long. 2, lat. $1\frac{1}{8}$ poll. *Hab.* Rio Janeiro.

This appears to be one of several species confounded under the Linnean *T. doliarium.* Deshayes has indicated it as a distinct species, but has not described it. The coloring is like *T. doliarium,* but the form and cincture is more like *T. cutaceum.* The aperture and lip is like *T. pileare*, and it may be regarded as intermediate between the two latter species.

Triton mundum. Testa parva, solida, oblongo-rhomboidea, straminea, epidermide tenui, sparsim hirsuto induta: spira conica, anfr. 4, convexiusculis, ultimo gibboso, tri-nodoso, in rostrum rectiusculum attenuato, costulis tribus et liris intermedianis cincto et filis continuis longitudinalibus decussato: apertura angusta, ovalis, $\frac{1}{2}$ testæ adequans; labro crasso, tuberculis geminatis 7 crenato; columella arcuatâ, posticè dentiferâ; fauce albo. Long. $\frac{7}{8}$; lat. $\frac{2}{5}$ poll. *Hab.* Tutuilla, Samoa Islands.

This might be regarded as the young of *T. nodosum;* but besides bearing all the marks of maturity, it is more slender, the longitudinal lines are stronger, and the lip is white.

Phos varicosus. Testa elongata, lanceolata, fulvida, rubiginoso-cincta, costis lamellosis ad 16 clathrata, quorum circiter 3 in singulis anfractibus, variciformibus, pallidioribus, interspatiis duplo latioribus, concavis et lineis incrementi striatis, omnibus filis volventibus retrorsum acclinatis decussatis: spira turrita, anfr. 9 – 10 superne turgidis: apertura angusta, lunata, posticè rotundata $\frac{1}{3}$ long. testæ adequans; labro simplici, intus sulcato, rosaceo; columellâ 4 plicatâ; canali siphonali brevi. Long. $1\frac{1}{8}$, lat. $\frac{9}{20}$ poll. *Hab.* Philippine Islands.

This curious shell is somewhat anomalous, having the varicose spire of a *Triton*, but the unequivocal aperture of *Phos.* It may be compared with *P. retecosus*, Hinds, having the more slender form and finer reticulation, but with the peculiar varicose lip, and nearly the same size and color. It is perhaps still more like *P. senticosus*, but it is much less asperous, and peculiarly inflated near the suture.

Murex (Trophon) fruticosus. Testa parva, tenuis, subrhomboidea, straminea: spira anfr. 5 – 6 angulatis, supernè concavo-declivibus, serie mediani spinarum armatis, spinis ad 6 tubulosis, subramosis, recurvo-adscendentibus; anfr. ultimo series tres spinarum lamellis longitudinalibus conjunctarum gerente: apertura ovato-trigona, $\frac{1}{2}$ testæ long. adequans; rostro brevi, dextrorsum deflecto. Long. $\frac{3}{4}$; lat. $\frac{1}{2}$ poll. *Hab.* New Holland.

It has the form, size, and armature of *M. noduliferus*, Sowb., which is described as being transversely striated, and with a very short canal.

The President presented in the name of Dr. R. W. Gibbes, of Columbia, S. C., several fossil teeth, viz.: three of the teeth of the *Zeuglodon*, three shark's teeth, and two casts of teeth of *Megatherium.*

Mr. Ayres presented to the Society a young Cetacean, probably *Phocæna communis,* which had been taken from the stomach of a Cod on the Grand bank. The specimen was in a perfect condition, and measured eighteen inches in length. It had probably never breathed, as the lungs were found uninflated.

Mr. Burnett presented in the name of Miss Dix, specimens of the Larvæ of *Prionus unicolor*, from the white pine trees of North Carolina, with pieces of the bark of these trees exhibiting their cocoons; also some Pupæ of *Buprestis fulvo-guttata*, an insect living in the same trees. He likewise presented on his own behalf a specimen of *Scolopendra morsitans* from Asia, and young and adult specimens of *Scorpio occitanus*, from South America.

The thanks of the Society were voted to Miss Dix for her donation.

M. Vattemare, present by invitation, presented in the name of the Minister from Chili, one hundred and six Chilian Birds. He also gave some account of his labors to bring about an international exchange of objects of Natural History, books, &c., and expressed a wish that as many copies of the Journal of the Society as could be supplied, might be placed in his hands for purposes of exchange.

On motion of Dr. Cabot, it was voted, that the Librarian be authorized to supply M. Vattemare with as many copies of the Journal and Proceedings of the Society in furtherance of his plans as he might see fit. Also, that the thanks of the Society be presented to the Chilian Minister, for his valuable donation through M. Vattemare.

The Committee appointed to confer with the Committee of the Trustees of the Massachusetts Agricultural Society, in reference to the disposal of the Library of that Society, reported that they had performed the duty assigned to them, and submitted a proposition from that Society, to deposit their books in the building of the Boston Society of Natural History, under certain conditions; and recommended that the proposition be accepted.

Voted, That the report of the Committee be accepted.

Voted, That the proposition contained in said report be accepted. The report is on file.

The Committee appointed to request of the Association entitled "a Republican Institution," the application of a part of their fund to the purposes of the Library of the Boston Society of Natural History, reported that they had attended to the duty assigned to them, and submitted a proposition from said Association granting the request of the Boston Society of Natural History under certain specified conditions; and the Committee recommended the acceptance of the proposition.

Voted, That the report of the Committee be accepted.

Voted, That the proposition of the Association, entitled "a Republican Institution," with regard to the application of their fund and books for the mutual benefit of said Association and the Boston Society of Natural History, under certain conditions, be, and it is hereby accepted by this Society.

Mr. John A. Loring and Mr. John Stearns, were elected members of the Society.

May 2, 1849.

ANNUAL MEETING.

Mr. T. T. Bouvé in the Chair.

Present, seventeen members.

The usual reports of the Curators, Treasurer, and Librarian were read, of which the following is an abstract: —

The department of *Geology* has received donations during the past year from Mrs. Amos Binney, Mr. D. P. Curtis, Prof. Jeffries Wyman, Dr. R. W. Gibbes, and the Curator. The whole number of specimens now belonging to the Cabinet, including duplicates, is about fifteen hundred, of which about one thousand are arranged in the cases.

The department of *Mineralogy* has been increased during the past year by the addition of five hundred and forty-two specimens, making the whole number now belonging to the Society about one thousand four hundred and fifty. Among those received within the year are many rare species and varieties new to the Cabinet, and nearly all are choice specimens. All the minerals recently received have had labels attached to them of uniform size and color, on which are written the name and locality when known, and if the specimen is valuable, the name of the donor. More than half of the old collection has been ticketed in the same manner, and considerable progress made in arranging the whole on the shelves in accordance with Beudant's system. Donations have been received during the year from Messrs. J. Eliot Cabot, Edward C. Cabot, T. T. Bouvé, T. G. Cary, Jr., William Stimpson, Dr. W. E. Coale, Prof. J. W. Webster, and the Curator; and specimens have been received in exchange from Lieut. J. McNab, U. S. A.

The department of *Comparative Anatomy* is in a good condition, and several valuable specimens have been added to its collections within the past year.

In the department of *Entomology*, the whole number of specimens belonging to the Society is about fourteen thousand, comprising about four thousand species. During the past year the following valuable donations have been received, namely, five hundred and forty species collected in the vicinity of Boston, presented by John M. Bethune, Esq.; one hundred and sixty specimens of British Moths, from a lady in England; from Dr. T. W. Harris, six hundred and seventy species, from the interior of Europe, especially valuable as having come from the hands of the distinguished entomologists C. J. Schönherr and C. J. Fahraeus; and about three hundred species from various sources. Great pains have been taken to exclude Dermestes and Anthreni, and to repair the ravages already committed by them. The collection has been arranged and classified principally in accordance with the system of Latreille.

The department of *Ornithology* has been increased by numerous additions during the past year, and now numbers somewhat over a thousand specimens, which are effectually secured against the ravages of insects. The classification and labelling of the collection are nearly complete, the habitat of each specimen in this department, as well as that of Comparative Anatomy, being indicated by the color of the label. Donations have been received, from Messrs. Russell Sturgis, Francis Gassett, J. M. Bethune, and the Curator.

In the department of *Conchology* the Cabinet of the Society has received many valuable specimens, chiefly from Dr. A. A. Gould, the Corresponding Secretary. The process of rearrangement, rendered necessary by the recent transfer of the collection from the old to the new building, has been nearly completed, and many of the specimens have been labelled.

The department of *Ichthyology* has received by donation during the year, from Mrs. Binney, sixteen Massachusetts fishes; from Dr. D. H. Storer, twenty-two species collected at Porto Cabello, and three belonging to our own waters; from Mr. H. B. Storer, ten species obtained by him in Northern Europe; from Dr. Forsyth, a rare fish from California; from the Curator, three species; and by purchase twenty-five species from Surinam. The collection contains three hundred and sixty species, comprised in one hundred and sixty-two genera. They are all in good condition and are arranged according to the system of Cuvier.

The Library has been increased during the past year by the addition of 54 volumes and 93 pamphlets. Whole number of volumes now belonging to the Library, 1320 ; pamphlets, 213.

The Committee appointed to nominate officers for the ensuing year reported the following list: —

PRESIDENT,
John C. Warren.

VICE-PRESIDENTS,
D. Humphreys Storer. Charles T. Jackson.

CORRESPONDING SECRETARY,
Augustus A. Gould.

TREASURER,
Patrick T. Jackson.

LIBRARIAN,
Charles K. Dillaway.

CABINET KEEPER,
Charles C. Sheafe.

RECORDING SECRETARY,
Samuel L. Abbot.

CURATORS,

J. E. Teschemacher,	*Of Botany.*
Jeffries Wyman,	*Herpetology.*
Samuel Cabot, Jr.	*Ornithology.*
T. T. Bouvé,	*Geology.*
Francis Alger,	*Mineralogy.*
William O. Ayres,	*Ichthyology.*
Waldo I. Burnett,	*Entomology.*
William Reed,	*Conchology.*
Samuel Kneeland, Jr.	*Comparative Anatomy.*

The Treasurer presented a transcript of his account for the year,

Showing a balance due from him to the Courtis Fund of		$890 53
Due to him from General Fund .	$297 13	
" " " " building " .	468 42	
	765 55	
Leaving a balance due from him .	124 98	890 53

The Treasurer recommended that immediate measures be taken to free the Society from debt, or else that the debt be put on a permanent footing by a mortgage on the Society's building.

A letter was read from Dr. John Bacon, Jr. the Curator of Mineralogy, declining a reëlection. It was also understood that Dr. N. B. Shurtleff declined a reappointment as Curator of Comparative Anatomy.

The candidates offered by the nominating Committee were next balloted for and elected to the respective offices for which they were nominated.

On motion of Dr. Storer, it was unanimously voted that the thanks of the Society be presented to Drs. Shurtleff and Bacon for their faithful and efficient services as Curators.

Mr. Desor exhibited a colored drawing, on a large scale, of a Medusa budding from a Polyp.

Mr. Bouvé read a report on the specimen of flexible Sandstone, recently presented to the Society by W. S. Bullard, Esq.

It was brought from the neighborhood of Agra and came from the formation known as the Itacolumite formation. It presented the characteristic elasticity of this substance in a remarkable degree. Mr. Bouvé doubted if this could be ascribed, in the present specimen, to the presence and interlacement of scales of mica, according to Prof. Shepard's hypothesis, as a careful examination with a powerful lens failed to detect this mineral.

A donation was announced of three bird skins from Dr. T. M. Brewer, and a specimen of fossil coral from Livingston County, N. Y. in the name of L. M. Ritchie.

May 16, 1849.

The President in the Chair.

Present, twenty-one members.

Dr. Bacon read a paper by Mr. T. S. Hunt, of the Geological Commission of Canada, on a new mineral, for which he proposed the name of Algerite.

This mineral occurs in Franklin, N. J., imbedded in a white crystalline limestone. The crystals are sometimes three inches in length, and rarely more than one eighth of an inch in thickness. They are frequently curved, like Sillimanite and Scapolite. Color brownish, yellowish white, or straw yellow, sometimes with a greenish shade. They are translucent, with a vitreous lustre. Some specimens bear a striking resemblance to Chondrodite, with which the mineral was at first supposed to be identical, when found in a few fragments. It has also been referred to Scapolite and Spodumene. Prof. Nuttall was the first mineralogist who expressed the opinion that it might be new, but he did not enter into any investigation of its characters; and for the last ten years it has been overlooked, until recently brought to light and examined in better specimens by Mr. F. Alger, whose description of its physical characters is copied by Mr. Hunt. The form of the crystals is an oblique rhombic prism, the angle of M on M′ being about 94°, as determined by the common goniometer. The terminal and basal planes, although plainly indicated, are not sufficiently distinct for measurement. The only modifications observed are replacements of the oblique and lateral edges of the prism by single planes. The specific gravity is 2.785 (Hunt,) and the hardness 3 — 3.5 (Alger,) or less than that of fresh crystals of Laumonite.

Its analysis afforded Mr. Hunt the following results: —

Silica 49.82, alumina 24.91, peroxyd of Iron 1.85, magnesia 1.15, potash 10.21, soda-traces, water 7.57, carbonate of lime 3 94. The composition of the mineral, deducting the carbonate of lime, which appears to be derived from the matrix, is a *hydrated silicate of alumina and potash*, in which small quantities of magnesia and iron replace in part the alumina and water. [These results Mr. Hunt reduces into one of the typical forms which Mr. Laurent has deduced from his researches on the natural silicates. This requires a ratio between the oxygen of the silica and that of the other oxyds of 5 : 4, and that of the silica being 26.60, theory demands for the bases 21.28, while experience gives 21.11.] Deducting the carbonate of lime, the composition for 100 parts is given below, the first column of figures representing the proportions actually obtained, and the other those required by theory based on the formula.

	Found.		Calculated.	
Silica	52.28		52.08	
Alumina	26.08		26.11	
Potash	10.69		10.88	
Peroxyd of Iron	1.93	11.05	2.45	10.78
Magnesia	1.20			
Water	7.92		8.33	
	100.10		99.85	

As the entire paper will appear in the Journal of the Society, it is not necessary to give here the details of the analysis and the formula deduced, which it is difficult to print. From its hardness and specific gravity, the mineral is evidently to be referred to the order Zeolite; from its density it is comparable with Datholite, Prehnite, and Lazulite, to which it is much inferior in hardness; while from the rare species, Edingtonite, to which in hardness and density it is closely allied, it is distinguished by its crystallization. Mr. Hunt offers it as a new mineral species, which will take a place by the side of Edingtonite; and to connect the name of one who has been one of the most successful cultivators of mineralogy with his favorite science, proposes for it the designation of *Algerite.*

Two specimens of this mineral were presented by Mr. Alger.

Dr. Gould continued his descriptions of the Shells brought home by the U. S. Exploring Expedition.

Buccinum (Bullia?) velatum. Testa solida, ovato-lanceolata, levis, polita, livido-violacea, albido-reticulata, versus labrum pallescens, et lineolis rubiginosis cincta : spira acuto-conica, anfr.

7 – 8 convexiusculis, serie suturali gemmularum coronatis, ultimo $\frac{2}{3}$ long. testæ adequante et ad basim spiraliter striato: apertura ovalis, posticè canaliculata; labro acuto, extrorsum incrassato, intus 10-sulcato; sinu siphonali obliquo, profundo, castaneotincto. Long. 1; lat. $\frac{2}{5}$ poll. *Hab.* Mindanao.

This may be compared with *Buccinum vittatum*, but is smaller, and proportionally shorter. Its aperture has the posterior callus, and small, closed siphonal notch of Nassa. The sutural vitta is very delicate; and its peculiar coloration, especially its pale lacelike reticulation, is quite distinctive.

Buccinum funereum. Testa elongata, ovato-conica, luridocinerea, striis tenuibus cincta: spira turrita, anfr. 6 – 7 supernè excavatis, infernè plicis longitudinalibus undatis: apertura angusta, ovalis, dimidiam long. testæ; labro simplici, posticè emarginato; columellâ rectiusculâ; fauce hepaticâ. Long. 1; lat. $\frac{1}{2}$ poll. *Hab.* New Zealand.

Another of the peculiar group of liver-colored Buccina from Australia, which seem to have a loose, porous, ash-colored superficial layer, with a posterior notch to the aperture, (*Tritonium ?*) It is well marked by the excavated constriction near the suture, and the coronated appearance produced by the termination of the folds at the middle of the whorls.

Buccinum fossatum. Testa tenuis, ovata, ventricosa, rufocinerea, annulis et sulcis subequalibus cincta: spira conica, anfr. 7 convexis, supernis clathratis, ultimo ventricoso, posticè declivi et obliquè fluctuato: anticè brevissimè rostrato; rostro canali valdè effosso cincto: apertura lata, ovato-quadrata; labro valdè arcuato; columellâ obliquè liratâ et callo tenui induta. Long. $1\frac{1}{4}$; lat. 1 poll.

Hab. Puget Sound and Mouth of Columbia River.

Its thin structure, ventricose form, the very oblique folds on the upper part of the large whorl, and the remarkable channel around the base of the siphonal notch, are its chief characters. It belongs to the same group as *N. trivittata*, Say. On some specimens a fine thread intervenes between the broader rings.

Buccinum (Pollia) farinosum. Testa parva, solida, ovatorhomboidea, lutescens rufo cincta, spiraliter granulato-filosa, longitudinaliter undato-plicata, plicis ad 8 acutis demum numerosis et propè labrum acutum in varicem terminantibus: spira brevis,

conica, anfr. 6 convexis, ultimo antrorsum acuminato, sub-reflexo: apertura angusta, lunata, labro intus 6 plicato; columellâ rugoso-granulosâ, callosâ; fauce albo. Long. $\frac{3}{8}$; lat. $\frac{3}{10}$ poll.

Hab. Sandwich Islands, Kauai.

This little muriciform species is quite pretty; and appears to belong to the group of which *B. undosum* is the type.

Nassa musiva. Testa solida, ovato-conica, polita, albido et olivaceo marmorata, coloribus in maculis quadratis tessellatim dispositis: spira conica, anfr. 6 – 7 convexis, benè discretis, ultimo $\frac{3}{4}$ long. testæ, propè labrum pallidiori, longitudinaliter plicato et lineolis olivaceis cincto: apertura $\frac{1}{2}$ long. testæ, ovalis, posticè canaliculata; columellâ valdè arcuatâ, obliquè sulcatâ; labro intus sulcato, sulcis fuscatis. Long. $\frac{4}{5}$; lat. $\frac{9}{20}$ poll. *Hab.* Cape de Verds.

This is one of the most beautiful species of the genus, and is well characterized by its polished surface, and its clouding of white and olive, made up of little quadrate spots, arranged in encircling series resembling mosaic. It may be *B. pictum*, Dunker.

Nassa lurida. Testa solida, conico-ovata, lævis, livido-cinerea albido-variegata: spira conica, acuta, turrita, anfr. 7 – 8 convexiusculis, supernè tabulatis et ad angulum crenato-nodosis, apicalibus plicatis, ultimo anticè sulcis 3 – 4 cincto et ponè labrum plicato; suturâ canaliculatâ: apertura $\frac{1}{2}$ long. testæ, ovalis, posticè emarginata; columellâ posticè lamelliferâ, anticè dentiferâ; labro acuto, albo, extus incrassato, intus sulcato; canali siphonali profundo. Long. $\frac{7}{10}$; lat. $\frac{3}{8}$ poll. *Hab.* Samoa Islands, Tutuilla.

Resembles *N. musiva* in surface and color, but the spire is more elevated, and there is merely a mottling of colors without any definite arrangement.

Nassa curta. T. abbreviata, ovato-conica, lutescens interdum rufo subfasciata, subspinosa, longitudinaliter plicata; plicis ad 13 tenuibus, acutis, liris conspicuis decussatis: spira conica, anfr. 6 convexiusculis; ultimo globoso $\frac{5}{8}$ long. testæ adequante: apertura rotundato-ovalis; labro crenulato, intus sulcato, extrorsum incrassato; columellâ callo copioso granuloso indutâ; sinu siphonali angusto, profundo. Long. $\frac{9}{20}$; lat. $\frac{8}{20}$ poll. *Hab.* Samoa Islands.

Remarkable for its broad, abbreviated form. In some of its characters it is allied to *N. muricata*, but its surface has much more numerous and more delicate asperities. Some specimens are distorted and still more finely sculptured, losing in a great degree the longitudinal folds. *Bucc. scabrum*, Dunker, must be like it, but is described as larger, more solid, and slender.

NASSA CINCTELLA. T. solida, ovato-conica, nitida, albida lineâ unicâ rufâ cincta, plicis longitudinalibus acutis ad 10 et striis volventibus ad 8 decussata: spira conica, anfr. 7 planiusculis angustè tabulatis, ultimo subgloboso $\frac{2}{3}$ long. testæ adequante: apertura angusta, ovalis, $\frac{1}{2}$ long. testæ haud equans; labro crenulato, extus incrassato, intus 7-sulcato; columellæ callo haud appresso, concinnè rugoso; incisurâ siphonali angustâ, profundâ. Long. $\frac{7}{20}$; lat. $\frac{1}{5}$ poll. *Hab.* Pacific Ocean.

This very pretty shell is well marked by its short conical form, its few prominent ribs, shouldered whorls, and thread-like vitta. It accords well with *Bucc. Jonasii*, Dunker, except that one of the principal characters of that shell is to have the interior of the lip smooth.

NASSA CASTA. Testa tenuis, lanceolata, vitrea, alba fasciis rubiginosis binis cincta, longitud. costato-plicata; plicis ad 14, striis remotis volventibus decussantibus: spira acuto-conica, anfr. 8 convexiusculis, apicalibus politis, ultimo $\frac{3}{5}$ long. testæ adequante: apertura elliptica; labro acuto, intus 11-striato; columellâ callosâ, concinnè corrugatâ; sinu siphonali amplo. Long. $\frac{2}{5}$; lat. $\frac{1}{5}$ poll. *Hab.* Pacific Ocean.

This elongated, glistening shell has no one with which it may be well compared. It is a little like *Bucc. macula* in size and form, but in other respects it is more like *B. Cuvieri.*

NASSA ACINOSA. T. solida, ventricosa, ovata, lutescens cinereo obscurè fasciata, papillis e sulcis volventibus et longitudinalibus æquè remotis ubique obsita, serie suturali majori: spira conica, anfr. ad 8 planis, declivibus, supernè tabulatis, ultimo magno, ventricoso: apertura parva, angusta; labro acuto posticè sinuato, intus 5–6 sulcato; columellâ valdè concavâ, posticè lamelligerâ, callo tenui indutâ; regione siphonali plano, albo, sinu amplo, profundo; fauce fusco-fasciatâ. Long. $\frac{7}{10}$; lat. $\frac{4}{10}$ poll. *Hab.* —?

Differs from the shell given by Kiener as young *B. marginulatum* by its more ventricose form, much coarser sculpture, less elongated spire, and the presence of the posterior lamina on the pillar. It may be compared with *Bucc. Gruneri*, Dunker.

Nassa paupera. T. parva, solida, ovato-lanceolata, albida lineâ rufâ unicâ cincta, longitrorsum 18-costulata, et liris continuis cincta: spira acuto-conica, anfr. 6–7 ventricosis, ultimo brevi, subgloboso; suturâ profundâ: apertura parva, subcircularis, $\frac{1}{3}$ long. testæ adequans; labro arcuato, intus 10-striato; columellâ anticè productâ, callo granuloso haud appresso parcè indutâ. Long. $\frac{3}{8}$; lat. $\frac{1}{5}$ poll. *Hab.* Pacific Ocean.

Much resembling *Bucc. coccinella*, but smaller, less ponderous, more slender, the last whorl proportionally larger, the ribs less numerous, but the revolving lines more so.

Nassa mendica. Testa parva, rudis, solidula, elongata, rufo-cinerea, longitrorsum undato-plicata, spiraliter crebrè lirata, epidermide tenui lutoso induta: spira elongata, anfr. 6–7 ventricosis, ultimo ellipsoideo, dimidiam long, testæ superante: apertura parva, alba, ovata; labro simplici, vix crenulato, intus 10-laminato; columellâ productâ, arcuatâ, vix callosâ; sinu siphonali amplo. Long. $\frac{4}{5}$; lat. $\frac{2}{5}$ poll. *Hab.* Puget Sound, Nisqually, &c.

A somewhat rude shell, very variable in its surface, being the Pacific analogue of *N. trivittata*, Say. It is more solid, more undulated, less shouldered, its pillar lip more protracted, and its aperture smaller. It is also closely allied to *N. perpinguis*, Hinds, from the California coast, though differing essentially from his description and figure.

Nassa rubricata. Testa parva, elongata, ovata, granulata, epidermide fulvo lineis interruptis rufis cincto induta, longitrorsum 15-costato plicata, plicis ad anfr. ultimum obliquis, versus labrum evanescentibus, et striis impressis decussatis; striâ suturali majori, seriem gemmularum efformante: spira acuto-conica, anfr. 6 convexiusculis: apertura $\frac{1}{2}$ long. testæ haud equans, rotundato-ovata, lactea; labro intus crenulato; sinu siphonali mediocri. Long. $\frac{5}{8}$; lat. $\frac{1}{3}$ poll. *Hab.* Pacific shore.

I know not any species with which to compare this, except perhaps, *Bucc. corrugatum*, from which it differs in its aperture. Its elongated form, oblique folds on the outer whorl, and its white aperture, are its most conspicuous characters. The revolving fawn-colored lines only appear when its deep brown epidermis is removed.

The President presented five teeth and a tympanic bone of the Zeuglodon, and gave an account of the observations upon this animal by Dr. Harlan, Prof. Owen, and Dr. Gibbes. He likewise presented three Peruvian skulls from the vicinity of Lake Titicaca.

The President pointed out the remarkable resemblance existing between these skulls and those found in the mounds of the western part of the United States, specimens of which he exhibited to the Society. He compared them also with an Indian skull dug up in Quincy, Mass., showing a very great difference of shape, the general contour of the head being much more round in the former, with a remarkable flatness of the posterior region and vertex, and greater breadth of forehead. The skull from Quincy was oval, and presented the great depth of the palatine fossa, so characteristic of the North American races generally.

On motion of Mr. Bulfinch, Dr. John Bacon, Jr. was elected on behalf of the Society, a delegate to the next meeting of the British Association for the Promotion of Science.

Mr. Burnett presented in the name of Mr. Joseph Burnett, a specimen of Sponge attached to the rock on which it grew. The thanks of the Society were voted for the donation.

Dr. Gould presented, in the name of Gould, Kendall & Lincoln, three books, namely, The Pre-Adamite Earth, and Man Primæval, by John Harris, and Earth and Man, by Professor Guyot. The thanks of the Society were voted for the donation.

Mr. Ayres presented a young salmon 8½ inches long, showing the transverse bands which do not exist in the adult fish.

Dr. Kneeland presented the following specimens, namely, Physalia or Portuguese Man of War; several species of fish and crabs from the reef at Pernambuco, Brazil; crabs and other crustaceans from the Gulf weed of the Atlantic;

two specimens of Exocetus or Flying fish of the Northern Atlantic; one Cuttle fish, and the head of a Coryphæna, from the North Atlantic.

Dr. Cabot announced that fourteen birds had been added to the collection since the last meeting, received in exchange.

Mr. Charles Siedhof, of Newton Centre, was elected a member of the Society.

June 6, 1849.

The President in the Chair.

Present, seventeen members.

Mr. Ayres presented two specimens of a new species of Leuciscus, from Fairfield County, Connecticut, much resembling *L. pulchellus*, with which it has been hitherto confounded, for which he proposed the name *L. pulchelloides.*

Leuciscus pulchelloides differs from *L. pulchellus* in the smaller size of its scales, which are sixty in number on the lateral line, instead of forty-seven or forty-eight; in the height of the anal fin, which is twice its length instead of a little less than equal; in the more pointed form of the pectorals and their length, which is one fifth of their height instead of two fifths; in the position of the ventrals, which are a little more in advance; and their length, which is one fourth of their height instead of two fifths. The right lobe of the liver is higher, and the gall-bladder more globular. P. 19 instead of 17. V. 10 instead of 8.

The President, in allusion to the skulls presented by him at the last meeting, repeated a tradition of the Delaware Indians: that their ancestors came from the north-west, and after crossing the Mississippi, became engaged in wars with the Ohio, or Mound Indians, which ended in the expulsion of the latter from their homes, and their disappearance towards the south. It is not impossible, that in their migration they crossed the Isthmus to the continent of South America and founded the race to which the South American skulls belong, which resemble so closely those found in the Ohio mounds. At an intervening point, the Natchez Indians present the same characteristic structure, and were possibly derived from the same stock.

Mr. Desor gave an account, illustrated with drawings on the blackboard, of the embryonic development of Campanularia.

He stated that he had recently had an opportunity of observing Medusæ, derived from the Campanularia. This mode of reproduction seems to take place earlier than the propagation by ova. The young Medusæ were found this year, about the wharves of Boston, as early as the month of March. I have ascertained, says M. Desor, that the cross-bands, which are to be seen on the middle of the disc, and which Van Beneden considers as muscles, are four accessory gastric channels, answering to the four similar channels which are so distinctly seen in the Oceania. Those swellings, likewise, which are to be seen at the origin of the said channels, and which Van Beneden thinks are probably nervous ganglia, are nothing but expansions of the membrane surrounding the central cavity; so that all inferences which have been drawn from these statements of M. Van Beneden, as to the presence of nerves in the embryonic state of Polyps, must be abandoned as unfounded.

M. Desor did not succeed in keeping these young Medusæ, the offspring of Campanularia, for more than two or three days alive, and could not therefore study their further growth and development. It has been supposed that they might be the young state of Stomobrachium, (the little bell-shaped Medusa, so common at this season about the wharves of Boston); but this view, although probable in some respects, is not yet substantiated by any direct observation.

The observations of M. Desor, whilst confirming in the main the results of his friend M. Lovèn, have led him to elucidate some points which had remained doubtful. The eggs in their early state are collected in bags attached to the gastric channe within the so-called ovarian-cell. As long as the bags remain within the cell, the germinative vesicle and germinative dot are distinctly seen in each egg. But by and by the bags are pushed out of the cell, and as each bag is surmounted by a tuft of from four to six tentacles surrounding a small opening, they were mistaken by M. Lovèn for real Polyps, and called by him female Polyps. But it is evident from the size, shape, and structure of these tentacles of the so-called female Polyps, that they serve a different purpose from those of the terminal Polyps, which are organs of prehension. They seem to be generally immovable, although they may be seen occasionally unfolding or contracting themselves. No satisfactory explanation had yet been given of the use of these tentacles, when it was suggested by Dr. Cabot, that they might be connected with the process of fecundation, in giving passage through the opening which they surround, to the Spermatozoids or animal pollen; thus we might explain in a satisfactory way, why it is that the disappearance of the germinative vesicle and the furrowing of the yolk, which are the surest indications of a beginning development, take place only when the bags have been pushed out of the cell and have thus come within the reach of the Spermatozoids.

This suggestion induced M. Desor to look more closely at the formation of these tentacles; since viewed in that light, they involved the very important question of a determined sexuality in these lower animals. Spermatozoids were said to have been seen by M. Krohn in the Campanularia. But this observation was doubted and contradicted by M. Van Beneden. M. Desor had never seen any true Spermatozoids, but he now remembered having noticed the last year similar tentacles on the top of cluster-like sacs, where no ova could be discovered. The same was found again this year. He noticed further in the interior of these bags a fine granular structure. On compressing them slightly, he saw these fine granules escaping from the cavity between the tentacles, and recognized them distinctly as Spermatozoids. But at an earlier period, before the Spermatozoids are ripe, the bags that contain them are hardly to be distinguished from the female bags containing eggs. An opening surrounded by tentacles, similar to that by which the Spermatozoids escape in the male cells or seminal sacs, serves for their reception in the female ovarian sac, and there is therefore some reason to suppose that the tentacles are intended to act as a means of diffusion and intromission of the sperma.

In their shape and structure the Spermatozoa of Campanularia do not differ much from those of Eudendrium, as figured by M. Kölliker. It ought further to be noticed, that, as in other Polyps, the Spermatozoa do not originate within peculiar cells, but fill the whole space of the seminal bag.

The sexes seem to be entirely distinct. Not only did M. Desor never see but one kind of cells on a branch, either males or females, but whole bunches were either exclusively female or exclusively male, so that a stem which divides by branching is able to produce only branches of its own sex; thus showing that simple budding does not constitute a true generation.

The process of furrowing was observed by M. Desor in all its stages, (as was shown by drawings laid before the Society.) The separation of the yolk spheres from each other is complete, so that they became easily distinguished. As a peculiarity of the spheres, it is, however, to be mentioned, that no clear spot could be detected in any of them, either in their early stage, (the division is 4 or 8,) or at a later epoch, when the yolk assumes the mulberry form. As the development goes on, there is seen a transparent zone forming around the yolk; this is the first indication of the germ, which elongates, and subsequently assumes the form of a little worm hardly perceptible to the naked eye, and covered all over with vibratile ciliæ. It is in this form that the embryo leaves the bag in which it has been developed. It is seen creeping slowly along the bottom of the vase, being in every respect very similar to the *Planulæ*, or embryos of Medusa and also of Nemertes. It was noticed that when moving, it advances always with the wider part of its body. This is the so-called infusoria state of the Campanularia, and in order to get at the perfect polyp state, the embryo has to undergo very remarkable metamorphoses, which have been fully and most satisfactorily investigated by M. Lovèn.*

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* On page 140 will be found a note containing a list of the various Treatises on this subject, which was added for purposes of reference. It was printed on the responsibility of the Publishing Committee, as M. Desor's absence from the city prevented his being consulted with regard to it while the sheets were passing through the press. To the list there given should be added, —

Alternations of Generations. By J. J. Sm. Steenstrup. Translated from the German by George Busk. 8vo. London, 1848. — *Publishing Committee.*

Dr. Cabot exhibited to the Society fifty mounted birds, most of them from the donation of the Chilian Minister. Among them were the following species, identical with species found in North America, and interesting as exhibiting the extent of their distribution ; namely, *Sterna Trudeauii*, found in New Jersey ; *Ardea candidissima*, found in the southern parts of the United States ; *Elanus dispar* or *leucurus*, found in Mississippi ; *Cathartes jota*, found as far north as Pennsylvania ; *Tinnunculus sparverius*, found in the northern parts of the United States ; *Calidris arenaria*, found all along the coast of the United States ; and *Totanus vociferus*, also found along the seaboard. Among the birds exhibited was a species of Fulica, a female, much resembling the North American species, but having a larger bill.

Dr. Silas Durkee, Mr. J. D. Nourse, and Rev. Joshua Young, of Boston, and Dr. Hiram Hosmer, of Watertown, were elected members of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING JUNE 30.

Monograph of the Fossil Squalidæ of the United States. By R. W. Gibbes. 4to. Pam. 1848. Philadelphia. *From the Author.*

Observations on the genus Unio. By Isaac Lea. 4to. 1841–5. Philadelphia. *From the Author.*

Gray's Genera of Birds. Part 47, for March, 1849. Long 4to. London. *Audubon Fund.*

Annals and Magazine of Natural History. Vol. III. 2nd Series. No. 15, for March, 1849. 8vo. London. *Courtis Fund.*

Observations at the Magnetic and Meteorological Observatory at the Girard College. 1840–45. 3 vols. 8vo. and one of plates. Washington, 1847. *From R. C. Winthrop.*

Proceedings of the Academy of Natural Sciences of Philadelphia. pp. 115 – 167 of Vol. IV. From the Academy of Natural Sciences.

A. Vesalii, Opera omnia Anatomica et Chirurgica. fol. 2 vols. Lugduni Batavorum, 1725. *From F. W. Cragin.*

American Journal of Science and Arts. 2nd Series. No. 21. May, 1849. New Haven. *Exchange.*

Correspondence of John Ray. 8vo. London, 1848. *Courtis Fund.*

Reports and Papers on Botany. 8vo. London, 1846. *Courtis Fund.*

Bibliographia Zoölogiæ et Geologiæ. A General Catalogue of Books, &c. on Zoölogy and Geology. By Prof, L. Agassiz. 8vo. London, 1848. *Courtis Fund.*

M. Tuomey. Report on the Geology of South Carolina. 8vo. Charleston, 1849. *From the Author.*

John Harris. The Pre-Adamite Earth. 12mo. Boston, 1849.

John Harris, Man Primæval. 12mo. Boston, 1849.

Arnold Guyot. The Earth and Man. Lectures on Comparative Physical Geography. From the French, by C. C. Felton. 12mo. Boston, 1849. *From Gould, Kendall & Lincoln.*

Proceedings of the American Philosophical Society. Vol. V. No. 42. 8vo. Pamph. 1849. Philadelphia. *From the American Philosophical Society.*

J. C. Loudon's Encyclopædia of Plants. 8vo. London, 1846. *From John Bacon, Jr.*

Partington, C. F. Manual of Natural and Experimental Philosophy. 2 vols. 8vo. London, 1849. *From John Bacon, Jr.*

Annals and Magazine of Natural History. Vol. III. No. 17, for May, 1849. *Courtis Fund.*

Gray, G. R., Genera of Birds. Part 48, including Appendix. *Audubon Fund.*

Annals of the Lyceum of Natural History of New York. Vol. V. No. 1. 1849. *From the Lyceum of Natural History.*

Surgical Observations on Tumors, with Cases and Operations. By John C. Warren, M. D. 8vo. London, 1839. *From the Author.*

Letter on the Dislocation of the Hip-joint. By John C. Warren, M. D. 8vo. Cambridge, 1826. *From the Author.*

Comparative View of the Sensorial and Nervous Systems in Men and Animals. By John C. Warren, M. D. 8vo. Boston, 1822. *From the Author.*

Description of an Egyptian Mummy. By John C. Warren, M. D. 8vo. Boston. *From the Author.*

View of the Mercurial Practice in Febrile Diseases. By John Warren, M. D. 8vo. Boston, 1813. *From John C. Warren.*

Physiological Effects of Alcoholic Drinks. 12mo. Boston, 1848. *From John C. Warren.*

Etherization; with Surgical Remarks. By John C. Warren, M. D. 12mo. Boston, 1848. *From the Author.*

Additional Observations on new living Species of Hippopotamus of Western Africa. By S. G. Morton, M. D. 4to. Pamph. Philadelphia, 1849. *From the Author.*

Ray Society. Monograph of the British naked-eyed Medusæ, with Figures of all the Species. By Edward Forbes. 4to. London, 1848. *Courtis Fund.*

Synopsis of the Coleopterous Insects of the group Cleridæ, which inhabit the United States. 8vo. Pamph. New York. By John L. Le Conte, M. D. 1848. *From the Author.*

Nouveaux Elémens de Botanique et Physiologie Vegetale. 6ième ed. Par Achille Richard. 8vo. Paris. 1838. *Exchange.*

Gray's Genera of Birds. Part 49. *Courtis Fund.*

Annals and Magazine of Natural History. No. 18. 2nd series. Vol. III. for June, 1849. *Courtis Fund.*

Bulletin de la Société Géologique de France. 2ième serie. Tome V. Feuilles 29-32. (19 Juin, 1848.) Tome VI. Feuilles 5-10. (4-18 Decembre, 1848.) *From the Société Géologique.*

July 18, 1849.

C. T. Jackson, Vice-President, in the Chair.

Six members present.

Dr. Storer presented, in the name of Rev. Zadock Thompson, of Burlington, Vt., descriptions and drawings of a new species of Esox, to which he gives the name *E. nobilior,* and a fish for which he proposes to establish a new genus under the name of *Salmoperca,* unless it should be found to come under Prof. Agassiz's genus *Percopsis*. *Esox nobilior* has been described by Richardson, and supposed by him to be identical with *E. lucius*, of Europe. It is in reality a distinct species.

Mr. Ayres said, on examination of the drawing of the fish called *Salmoperca*, that it evidently belonged to the genus *Percopsis*.

PERCOPSIS PELLUCIDA.

Description. General color, light brownish yellow, with longitudinal rows of brown spots, about 0.1 in. in diameter, usually one along the dorsal line, and two rows on each side between the dorsal and lateral line. A broad satin stripe embracing the lateral line. Belly, white. Fins and flesh, translucent, the vertebral column, the abdomen, and portions of the head only appearing opaque when held to the light.

Fins all large in proportion to the size of the fish. The rays of the pectoral reach half their length beyond the base of the ventrals. Attachment of the ventrals beneath and a little anterior to the beginning of the first dorsal, their points reaching the anus. The anal fin has its first ray short and spinous. Caudal fin, forked.

Nostrils and eyes large ; irides yellow. Depression between the eyes divided longitudinally by a bony ridge. Seven small sinuses along the under jaw on each side. Edge of the preoperculum finely serrated. Scales rough on account of their serrated margins. Length, from 3 to 5 inches. The following are measurements from one of three nearly equal recent specimens, which were before me when the above description was made. Total length, 3.9 in.; to the centre of the eye, .5 ; posterior edge of the operculum, .9 ; pectoral fin, 1 ; ventral, 1.45 ; first dorsal, 1.5 ; and 2.1 ; adipose, 2.6 ; centre of the base of caudal, 3.2 ; longest caudal rays, .7 ; central, half as long.

Rays B. 6, D. – 11 — 0, P. 13, V. 8, A. $\frac{1}{7}$, C. 17$\frac{3}{3}$.

This fish was first described by me in 1841, from a single specimen found dead on the shore of Lake Champlain, and received the name here given to it in my manuscript notes. In 1847, two other specimens were found dead on the shore. The present Spring (1849), I have obtained three or four specimens, caught in Winooski river, in Burlington, and brought to me alive. The fishes, which I have examined, vary from 3½ to 5 inches in length.

Dr. Storer presented, in the name of Capt. Atwood, of Provincetown, a specimen of *Hippocampus hudsonius*, and in the name of Dr. Dowse, of Clintonville, Mass., a specimen of the fish, considered by Mr. Ayres as *Cottus gobio*.

Mr. Ayres mentioned that a specimen of *Cottus variabilis* had been recently caught near Craigie's Bridge, in this city; it being the first specimen which has been taken north of Cape Cod.

Dr. Burnett presented two specimens of malformed Butterflies, of the species *Arctia virginica* and *Clisiocampa Americana*.

He stated that having frequently before noticed similar malformations, he had, during the last season, tried some experiments to ascertain whether they might not be due to imperfect nutrition. Having placed in confinement some of the larvæ of the *Cerura borealis*, which feeds upon the willow, he kept them on a scanty supply of food. They went through their various transformations in due time and came out many of them malformed butterflies, exhibiting various modes of imperfect development.

Mr. F. J. Bumstead deposited in the Society's Collection the following mounted birds, namely: *Fringilla spinus*, European Siskin; *F. montifringilla*, Brambling Finch; *Alauda arvensis*, Skylark; *Turdus musicus*, European Song Thrush; *Lanius excubitor*, European Butcher Bird; *L. collurio*, Red-backed Shrike, *Sturnus vulgaris*, European Stare, male and female; *Otis tarda*, Great Bustard, female; *Archibuteo Sancti-Johannis*, Rough-legged Falcon, adult; *Sterna nigra*, European Black Tern, male and female; *Tringoides hypoleucus*, Green Tatler, male and female.

Mr. T. S. Hunt, of Montreal, was elected a Corresponding member.

August 1, 1849.

C. T. Jackson, Vice-President, in the Chair.

Present, twelve members.

Dr. W. I. Burnett read a paper on the Epithelial Tissues.

He had recently made these tissues the subject of special study, having had an unusually favorable opportunity of prosecuting his researches upon numerous specimens of Epithelium, obtained from the "*rice water*" discharges of cholera patients. He had been enabled to trace the development, by means of the microscope, of the three forms of this tissue, the cylinder, tesselated, and ciliated.

Dr. Burnett entered quite at length upon the subject of the cause of the motion of cilia in mucous membranes, giving an account of various experiments of his own, by which he had been led to the following conclusions, differing somewhat from those of former observers.

1st. If the movements of the cilia of epithelial cells are due to a contractile tissue at their lower portion, this tissue is unlike any other contractile tissue of the animal economy with which we are acquainted.

2d. We have no reason to suppose this tissue to be muscular, because of the relative size of the cilia to the muscular fibrillæ, and the absence of nerves, and because electrical agencies do not affect it.

3d. We cannot consider the contractile tissue of the nature of that of the Dartos, because the movements of the cilia are of a uniform and rythmical character.

4th. That, as these movements continue up to the time of the death of the cell, they are intimately connected with the life of the cell, considered as an individual organism.

5th. That these ciliary motions of epithelial cells are in many respects analogous to those of separate individual animals, as the Infusoria, and also to those of the ova of Polyps.

6th. That after a full consideration it is apparent that ciliated epithelial cells, (spermatic particles included), although they scarcely have the character of Individual Animal cells, differ widely from cells in general, particularly in exhibiting a higher form of vitality and function.

Dr. Burnett also gave an account of the reproduction of epithelial cells, and traced their affinities to organisms of individual animal life. The paper was illustrated very fully by diagrams on the blackboard.

Mr. Alger read the following statement with reference to the mineral, Hydrate of Magnesia from Hoboken, New Jersey, recently analyzed by Mr. J. D. Whitney.

Mr. Whitney's recent analysis of the Nemalite of Hoboken, New Jersey, by which he shows, contrary to the results of previous analysts, that the mineral is a pure Hydrate of Magnesia, establishes two varieties of hydrate of magnesia (otherwise called Brucite by some mineralogists,) and I would suggest the name of Lamellar and Fibrous Brucite, the last referring to Nemalite. There can be no doubt that Dr. Thompson's and Mr. Cornell's specimens were both impure. It was the foliated variety which Dr. Bruce discovered, analyzed, and named, " Native Hydrate of Magnesia." Since Dr. Bruce's time it has been found in other parts of the world.

Mr. Alger presented specimens of Tourmaline in Quartz, from Fitchburg, Massachusetts; Micaceous specular iron; and Carbonate of lime in hexahedral tables from Peekskill, New York.

Mr. Sheafe presented in the name of Mr. Elliot Torrey the skull and horns of an Asiatic Buffalo; also four cases of Asiatic insects. The thanks of the Society were voted for the donation.

A Tarantula, *Phrynus reniformis*, from Honduras was presented in the name of Mr. Robert B. Storer; and a large grasshopper from Caraccas, in the name of Mr. J. P. Bigelow; also an Agama, *A. Douglasii*, from Texas, by Mr. Alger. The fœtus of a seal was presented in the name of Dr. John Flint.

Mr. William Stimpson of Cambridge was elected a member.

August 15, 1849.

C. T. Jackson, Vice-President, in the Chair.

Present, eleven members.

Dr. W. I. Burnett gave an account, with illustrations on the blackboard, of certain animals which he had recently observed by the microscope in the blood of a person who had died with a chronic enlargement of the spleen. Dr. Burnett's account was as follows.

While recently examining with the microscope some blood taken from a human female who had died with an enlarged spleen, I was surprised to perceive in the field of observation, beside the usual corpuscles, very numerous naviculoid bodies. They were rather more than twice the size of blood corpuscles, swollen in the middle and pointed at both ends, and of a dark gray color. In many respects these bodies resembled the *loricæ* of some of the naviculoid Infusoria; but they were not loricæ, since by the addition of water they became swollen, and were therefore saccular. No motion could be perceived; but that they were animals can justly, I think, be inferred, from the fact that their external envelope presented some traces of organization. I feel the more confirmed in this view as Glüge (Müller's Archives, 1842, p. 148) mentions a hæmatozoon, which, if I draw a correct picture in my mind from his verbal description, this one would closely resemble. Glüge found it in the blood of a frog. Valentin also mentions (Müller's Archives, 1841, p. 435) having found hæmatozoa in some of the lower Vertebrata.

Dr. C. T. Jackson read a letter from Increase A. Latham of Milwaukie on the subject of "Medical Geology." The tendency of the letter was to confirm the opinion heretofore expressed by Dr. Jackson, that cholera is not likely to occur on the primary formations.

Some conversation ensued on the subject, various members quoting authorities and mentioning facts at variance with this opinion. Dr. Jackson said he did not ascribe any mysterious power to the primary formations in banishing cholera, but he thought this disease more likely to prevail over the more recent and tertiary rocks, from the character of the water drank by the inhabitants in such localities.

Dr. C. T. Jackson read a paper on the Mirage of Lake Superior of the months of July and August, 1847.

During these two seasons this phenomenon was often witnessed by Dr. Jackson. His theory of the mirage was as follows: The water of Lake Superior is very cold, the temperature seldom rising above 50° Fahrenheit, even in the hottest weather. In the summer season the temperature of the air in the forests near the shore is frequently as high as 90°, or even higher. Dr. Jackson supposes that a current of warm air loaded with moisture is blown from the shore, and coming in contact with a stratum of cooler air, in contact with the Lake surface, a film of moisture is condensed above it, which acts as a mirror to reflect the objects beneath.

Dr. J. B. S. Jackson gave an account of a recent visit he had made to Mr. Marsh's collection of Ornithichnites.

In connection with this subject Dr. C. T. Jackson said, that on the shores of Lake Superior he had seen some remarkable bird-tracks made under his observation by the American Raven. The peculiarity of these tracks consisted in the elongation for a number of inches of the impression of the middle toe. This was produced by the bird's trailing this toe on the sand as it slowly walked over the surface. Some of the Ornithichnites present this singular disproportion in the length of the track of the middle toe, which can hardly be accounted for in any other way. This mark of the toe is curved inwards also, as it is in the Ornithichnites, a natural result of the gait of the bird.

Dr. Gould gave descriptions with drawings of several new species of shells brought home from the United States Exploring Expedition, as follows: —

Columbella valga. T. ovato-lanceolata, sub-distorta, fulvo-marmorata et lineolis crebris rufis cincta, ad apicem rosacea;

spirâ acuminata, anfr. 9 – 10 convexiusculis, supernis longitrorsum tenuiter plicatis, ultimo lævi, contracto, cæteris nonconformi, $\frac{3}{5}$ long. testæ adequante; suturâ profundâ; apertura angusta, lunata; labro arcuato acuto, intus sulcato; columellâ transversim plicatâ, callosâ; sinu siphonali angusto, producto. Long. $\frac{1}{2}$; lat. $\frac{1}{5}$ poll. *Hab.* Pacific?

Closely allied to *C. avara*, Say, in form, size, and ground color, but readily distinguished by its distorted form, the encircling chestnut lines, and the want of revolving striæ between the folds.

COLUMBELLA CASTANEA. T. parva, solida, elongata, ovata, lævis, castanea vel fasciâ angustâ albidâ cincta: spira ovato-conica, anfr. 7 convexis, ultimo ovali $\frac{2}{3}$ long. testæ superante, ad basim spiraliter striato: apertura ampla, alba; labro recto, posticè emarginato, rufo-tincto, intus sub-plicato; columellâ anticè plicatâ; sinu siphonali amplo. Long. $\frac{1}{2}$; lat. $\frac{3}{8}$ poll. *Hab.* Rio Janeiro.

Compared with *C. unicolor* it is smaller, the aperture is less rotund, and it has a pale cincture.

COLUMBELLA GAUSAPATA. T. parva, solidula, elongata, ovato-conica, ad basim spiraliter striata, sub epidermide rudi subrufo concinnè rufo-reticulata vel variemodè maculata aut fasciata: spira conico-turrita, anfr. 6 – 7 convexiusculis, ultimo $\frac{2}{3}$ long. testæ, anticè subitò in rostrum brevem angustato; suturâ valdè impressâ: apertura angusta lunata; labro simplici, rufo, intus sparsè denticulato. Long. $\frac{1}{2}$; lat. $\frac{1}{5}$ poll. *Hab.* Puget Sound.

An inelegant, very simple species allied to the preceding; but it is less ventricose, the aperture paler and narrower, which with its tough, wooly epidermis sufficiently characterize it. Beneath the epidermis it is polished and finely reticulated, blotched or banded.

MITRA VITELLINA. T. lanceolata, solida, dilutè aurantia maculis albis fasciata, sulcis linearibus ad 15 lyrata et striis tenuibus crebris cincta; intersectionibus punctatis: spira elevata, anfr. 8 – 9 planis, ultimo $\frac{5}{8}$ long. testæ, cylindraceo, anticè angustato: apertura angusta; labro recto, simplici; columellâ 4-plicatâ, sinu siphonali brevi, vix recurvo. Long. $1\frac{3}{4}$; lat. $\frac{7}{20}$ poll. *Hab.* — ?

MITRA FIDICULA. T. lanceolato-fusiformis, livido-crocea, fas-

ciâ albidâ unicâ cincta, plicis acutis albidis ad 12 lyrata; spira anfr. 9 planulatis posticè tabulatis, apicalibus (ultimo etiam ad basim) spiraliter striatis: apertura angusta, intus tenui-striata; columellâ 4-plicatâ; fauce rufo; canali siphonali curto, ferè recto. Long. $\frac{3}{4}$; lat. $\frac{3}{10}$ poll. *Hab.* — ?

Mitra cophina. T. fusiformis, albida, liris volventibus et liris longitudinalibus altioribus ubique reticulata; areolis interceptis profundis: spira turrita, anfr. 9 – 10 planiusculis subtabulatis, ultimo antrorsum in rostrum contortum subitò desinente: apertura angusta, flexuosa, posticè obtusa; columellâ 4 plicatâ, plicis antrorsum minoribus. Long. $\frac{8}{10}$; lat. $\frac{3}{10}$ poll. *Hab.* Singapore.

The form, size, and color is like *M. suturata*, Reeve, but the sculpture is quite different, that species having no longitudinal ridges, and the transverse grooves are described as deep and punctured, and the intermediate ridges slightly granose.

Mitra rorata. T. modica, solida, lanceolata, cinerea rubiginoso-marmorata, clathris longitudinalibus quadratis ad 30 et striis tenuibus volventibus decussata: spira elevata, anfr. 9 – 10 planis posticè angulatis; ultimo cylindraceo anticè sensim attenuato, dimidiam long. testæ superante: apertura angusta, labro acuto, roseo, 13-sulculato; columellâ 4 plicata; rostro lato obliquè reflexiusculo; fauce incarnato. Long. $\frac{4}{5}$; lat. $\frac{3}{10}$ poll. *Hab.*— ?

The form and sculpture is much like that of *M. hebes*, Reeve, but the coloring is more like *M. crenifera*. It is more cylindrical and the bars are less prominent than *M. cophina*, besides the difference in coloration.

Mitra capillata. T. parvula, elongata, ovato-fusiformis, polita, rufo-castanea lineolis longitudinalibus flexuosis croceis ornata: spira acuto-conica, anfr. 7 convexiusculis, ultimo bifariam attenuato, anticè striis prominulis cincto; suturâ impressâ: apertura $\frac{1}{2}$ long. testæ, angusta, elliptica; columellâ 3-plicata, posticè callosâ; fauce lurido. Long. $\frac{9}{20}$; lat. $\frac{1}{5}$ poll. *Hab.* Madeira.

This beautiful little shell is easily identified by its dark mahogany color and its delicate yellow lineations, like those on some species of Neritina. *M. semen*, Reeve, which is not so slender, and has fewer and broader lines, is the only species approaching it.

Mitra encausta. T. parvula, solida, curta, ovato-rhomboidea, cinerea, longitrorsum 8 – 9 plicata et sulcis fuscentibus cincta: spira conica, anfr. 8 ventricosis, supernis granulosis, ultimo $\frac{2}{3}$ long. testæ adequante; suturâ canaliculatâ: apertura parva, linearis; labro acuto, vix sulcato; columellâ plicatâ, posticè callo copioso indutâ. Long. $\frac{7}{20}$; lat. $\frac{1}{5}$ poll. *Hab.* Feejee Islands.

A small, very decidedly marked species, most remarkable for the deeply incised, somewhat punctate, dark revolving lines on an ash-colored ground, its wave-like folds and its short rhomboidal form.

Conus dilectus. T. parva, gracilis, conica, albida ferrugineo concinnè reticulata et seriebus binis macularum candidarum et rufarum alternantium cincta: spira elevata, concavo-conica, anfr. 8 – 9, angulatis, coronatis, posticè striatis, ultimo inermi, anticè 6 – 8 sulcato: apertura linearis; columellâ rectâ; fauce incarnato. Long. $\frac{1}{2}$; lat. $\frac{1}{4}$ poll. *Hab.* Fejee Islands.

Dr. Gould presented, in the name of Dr. George A. Perkins of Cape Palmas, Africa, a cranium of an adult specimen of *Troglodytes gorilla*, the new species described by Prof. Jeffries Wyman. Also two monkeys' skins, a number of jars of Echinoderms, Fishes, &c. Among them was an Achatina, which proves to be viviparous, its oviduct being filled with young.

Dr. Shurtleff presented, in the name of Mr. Theodore Simmons, of Boston, a white deer skin from Maine.

Mr. T. G. Cary, Jr., was elected a member of the Society.

September 5, 1849.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, fifteen members.

In the absence of the Recording Secretary, James W. Stone was appointed Secretary *pro tem.*

Dr. Storer presented a monograph sent for publication in the Journal of the Society, by Dr. John Le Conte, on the

Pselaphidæ of the United States. The introduction was read, containing tables exhibiting the analogies between the American and European species of Coleoptera, and showing the importance of a careful examination of the structure of the antennæ in forming the different subdivisions.

Mr. Ayres made some remarks upon a species of Pike, described by Dr. Richardson in his Fauna Boreali Americana as the *Esox lucius.*

This fish has been also described by Rev. Zadock Thompson, under the name of *Esox nobilior.* In a pond near Bellows Falls the Pike, having been artificially introduced, has passed from thence into the still water at the foot of the Fall, where it is said to grow to the size of twenty or thirty pounds.

Mr. Ayres noticed this difference in the two species. In the *Esox lucius* the side of the head is smooth, but in the *Esox estor*, there is a mark of scales on the anterior edge of the operculum.

Mr. Ayres observed that the rivers of New England are this year very low, and that there is a remarkable disease in the fishes, which consists in the appearance of black spots scattered over the entire surface of the fish. On the removal of the scale the spot remains. It appears to be an ecchymosis in the fold of skin which encloses the base of the scale. It sometimes covers all the gill membranes.

Dr. Storer inquired whether it was not a parasite.

Mr. Ayres said that he had been told that it was, but he had been unable to discover any parasite. He had often seen parasites in fresh-water fishes, and once in a salt-water fish. But the spots referred to have a totally different appearance.

Mr. Ayres added, that this disease in the fishes finally destroys the rays of the fins by cutting them off at the joints, so that the tail-fins are reduced to little stumps. This effect is also sometimes produced by parasites.

Dr. Burnett had examined some *larvæ,* received from Dr. George Bartlett of Boston, which had been vomited by a gentleman affected for several years with dyspepsia. Dr. Burnett had compared the insects and found them nearly identical with the *Calliphora vomitoria,* which lays large quantities of eggs in putrid meat, the eggs being about a line in length and shaped like a kernel of rye.

Dr. Burnett presented male and female specimens of the *Balaninus nasicus*, the latter of which he had caught in the act of perforating the hazel-nut. It had been conjectured that this was the insect which bored the hazel-nut and chestnut, but it had never been previously seen in the act. Dr. B. also presented a specimen of the *Balaninus rectirostris*, found upon an oak tree. Habits unknown.

Dr. Burnett stated that a spring containing fifty-one per cent. of Free Sulphuric Acid had been discovered in Genesee County, New York. A specimen of the water was presented.

Dr. Gould presented a specimen of the *Scincus quinquilineatus*, from Frederick D. Allen, from Oberlin, Ohio. Also large specimens of the Kentucky shag-bark, *Carya squamosa?* from President Malcom; and a large moth.

Dr. Storer presented, in the name of Dr. Morland, a collection of Barnacles from Saco. Dr. S. read a letter from Dr. John T. Plummer of Richmond, Indiana, accompanying the pelvic bones of a Giraffe, presented to the Society. The thanks of the Society were voted to the donor.

Dr. S. Cabot announced the addition of nine birds to the Society's Collection, as follows: —

Xanthornus varius, Orchard Oriole; donor F. Gassett, by exchange.

Heteropoda semipalmata, semi-palmated Sandpiper, female; donor Dr. Samuel Cabot, Jr.

Sterna hirundo, Arctic Tern; donor Dr. S. Cabot, Jr.

Lanius excubitor, Great European Shrike; Garden of Plants, by exchange.

Ortygometra crex, Corn Crake; Garden of Plants, by exchange.

Bucco tectus, Lesser pied Barbet; Garden of Plants, by exchange.

Tiaris jacarina, male; Garden of Plants, by exchange.

Ardea minuta, Lesser European Heron; Garden of Plants, by exchange.

A coral upon a pearl oyster was received from Mrs. Steele of Roxbury through Mr. Dillaway, and the thanks of the Society were voted for the donation.

Two specimens of black Tourmaline and a crystal of Quartz were presented by Mr. Alger.

September 19, 1849.

Dr. A. A. Gould in the Chair.

Present, sixteen members.

Mr. Stimpson presented a description of a new species of *Helix*, as follows: —

H. EXIGUA. H. t. minutâ, discoideâ, pellucidâ, corneo-viridescente, suprâ convexiusculâ, infrâ concavâ; anfr. 3½ convexis, spiraliter striatis, et [apice excluso] costis longitudinalibus, distantibus, strias incrementales obliquè decussantibus instructis; anfr. ultimo rotundato; suturâ impressâ; umbilico lato; aperturâ rotundatâ; labro simplici. Diam. .078 poll. *Hab.* Massachusetts, vicinity of Boston.

Young specimens of *H. striatella*, which it much resembles, have nearly one whorl less, want the revolving lines, and have the whorls somewhat angular, instead of rounded. I have found it in various localities in the vicinity of Boston, usually under dead leaves, in low, moist places. It has also been found in Salem by Mr. Joseph True.

Dr. Gould gave an account of some tame fishes and turtles at Hingham, Massachusetts. They have been tamed by a little girl seven years of age, who is in the habit of feeding them. They come at her call to the shoal margin of the water in which they live. It is a question whether the fish are not guided by the sense of sight. The turtles undoubtedly are led by the sound of her voice. The fish are mostly of the species *Pimelodus nebulosus*, Horn-pout; and the turtles are *Emys guttata* and *picta*.

Dr. J. M. Warren exhibited, preserved in alcohol, the glands which secrete the acrid fluid which furnishes a means of defence to the American Skunk, *Mephitis Americana*. These glands are situated on either side of the intestine, at the root of the tail, just within the anus, and are about an inch in diameter. When the animal is pursued, the lower part of the intestine is prolapsed through the anus, the tail is elevated over the back, and by the contraction of the muscles of the anus the acrid fluid is ejected in two streams to the distance of six or eight feet.

Dr. Warren also exhibited to the Society a living specimen of *Mephitis Americana*, which had been deprived of its power of annoyance by a surgical operation. The animal was first made partially insensible by enclosing him in a barrel in which was placed some chloric ether. As he became stupefied, a sponge containing the anæsthetic agent was placed over the nostrils and kept there until entire insensibility was produced. Dr. Warren then cut down, on the outside of the intestine, upon the ducts of the glands and divided them, suffering the glands to remain *in sitû*. The animal recovered, being entirely deprived of his means of annoyance by the adhesive inflammation following the operation.

Four Hindoo skulls with a mounted Jackal's skin and the skeleton of a Jackal, were presented to the Society in the name of Mr. W. S. Bullard, to whom they were sent at his request by a Hindoo gentleman, by name Rájinder Datt.

Dr. Kneeland presented, in the name of Dr. Shurtleff, five skulls of Monkeys, a skull of a Snapping Turtle, *Emysaurus serpentina*, of a Spaniel, Sloth, Rabbit, Adjutant Crane, and Eagle.

Mr. Charles Girard of Cambridge was elected a member of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING SEPTEMBER 30.

American Journal of Science and Arts. By B. Silliman and B. Silliman. Jr., and James D. Dana. 2d Series, No. 22, for July, 1849. *From the Editors.*

New Mexico and California. By Emory Abert. Cook & Johnston. 8vo. Washington, 1848. *From R. C. Winthrop.*

Annals and Magazine of Natural History. No. 19, Vol. IV. for July, 1849. 8vo. London. *Courtis Fund.*

Reports, &c. of the Smithsonian Institute. 8vo. Pamph. Washington, 1849. *From the Smithsonian Institute.*

Floræ Calendarium. 12mo. Boston. (In MSS. by F. A. Eddy.) *From S. Kneeland, Jr.*

Organographie Végétale. Par M. Aug. Pyr. de Candolle. 2 vols. 8vo. Paris, 1846. *Exchange.*

Catalogue of Plants of Cincinnati. Collected by T. G. Lea. 8vo. Pamph. Philadelphia, 1849. *From J. M. Lea.*

Annals and Magazine of Natural History. No. 20. Vol. IV. 2d Series. For August, 1849. *Courtis Fund.*

Synopsis of the genera of Gammaracea. By James D. Dana. 8vo. Pamph. *From the Author.*

Conspectus Crustaceorum, quæ in orbis Terrarum Circumnavigatione, Carolo Wilkes e Classi Reipublicæ Federatæ Duce, lexit et descripsit, J. D. Dana. 8vo. Pamph. Cantabrigiæ, 1847–50. *From the Author.*

Gibbsite and Naophæne, from Richmond, Mass. By Prof. B. Silliman, Jr. 8vo. Pamph. New Haven, 1849. *From the Author.*

Zoölogy of the Voyage of H. M. S. Samarang. Nos. 1, 2, 4, 5. 4to. London. 1848. *Courtis Fund.*

Proceedings of the Zoölogical Society of London, with Illustrations. Parts 2, 3. 8vo. Pamph. 1848. London.

Parnell, A. P. Applied Chemistry in Manufactures, Arts, and Domestic Economy. 8vo. New York, 1844. *Exchange.*

Carver, J. Travels in N. America. 12mo. Boston, 1797. *Exchange.*

Fisher, William. Voyages and Travels of Capts. Lewis and Clarke. 12mo. Baltimore. 1812. *Exchange.*

Morfit, Campbell. Perfumery; its Manufacture and Use. 12mo. Philadelphia, 1847. *From S. Kneeland, Jr.*

Bulletin de la Société Géologique de France. 2ième serie. Tome IV. Feuilles 79 – 86. (5 Juillet, 1847.) Also Tome VI. Feuilles 11 – 18. 18 Decr. 1848. — 5 Fevrier, 1849. 8vo. Pamph. Paris.

System of Geography, by M. Malte-Brun. 48 Nos. 4to. Boston, 1847. *Exchange.*

Silliman's American Journal of Science and Arts. No. 23. Vol. VIII. 2d Series. 8vo. New Haven. *Exchange.*

Gelehrte Anzeiger. Vols. 26 and 27. 4to. München, 1848 – 49. *From the Munich Academy.*

D. Max Petterkofer. Die Chemie in ihrem Verhaltnisse zum Physiologie und Pathologie. 4to. Pamph. München. 1848. *From the Munich Academy.*

Denkrede auf Joseph Gerhard Zuccanini. Von Carl Friedr. Phil. v. Martins. 4to. Pamph. München. 1848. *From the Munich Academy.*

Bulletin de la Société Géologique de France. 2ème serie. Tom. IV. Feuilles 87 – 92 (10 – 23 Sept. 1847) 8vo. Pamph. Paris, 1847. *From the Société Géologique.*

October 3, 1849.

Dr. A. A. Gould in the Chair.

Present, fifteen members.

Dr. Jeffries Wyman exhibited to the Society two malformed Cod's skulls, brought by him from Labrador.

The variety of Cod, from which the specimens were taken, is known to the fishermen of those regions by the name of the "Bulldog Cod fish." In the specimens exhibited, the upper part of the frontal bones was rounded, making a sort of forehead. In one of them the maxillary bones were short, and the vomer and frontal bones bent up. In the other the vomer was bent to one side. Among the many thousands of cod annually caught in the vicinity of Labrador, not more than three or four, or six, are taken of this variety.

Mr. Ayres said that he had observed similar malformations in fish, as in the case of the Bass exhibited at the meeting of February 21st, 1849. He had also been informed by Prof. Agassiz that such deformities are occasionally found in the European Trout. Mr. Ayres remarked, that the specimens before the Society, with those he had before seen, made up the number of five, that had come under his observation with this malformation, in three genera.

Dr. Wyman made a report on the cranium of the Engéena (*Troglodytes gorilla*) recently presented to the Society by Dr. George A. Perkins of Salem; also on that belonging to the Essex County Natural History Society.

The first skull was that of an adult male, as was indicated by the fact, that the teeth were all protruded, though they were not worn. As in the crania formerly described, the sutures were for the most part obliterated. He thought there were indications that the portion of bone, which was found between the inner orbitar angles of the frontals, and which was described as the ascending portion of the nasals by Mr. Owen, was an independent piece, and had a centre of ossification of its own.

He had measured the capacity of this cranium, and of three other crania of the Engéena and found it as follows: —

I. Male, ...	34.5
II. Male, ...	28.3
III. Male, ...	28.0
IV. Female, ...	25.0

Dr. Wyman was disposed, after an attentive examination of the anatomical evidence, to regard the Engéena as occuping a lower position in the Zoölogical series than the Chimpanzée (*T. niger.*) Its brain was proportionally smaller, the molar teeth were more pointed, the canines larger, the wisdom tooth was of the same dimensions as the other molars. Several other characters existed which indicate its lower position.

Specimens of minerals and a cranium of a *Manatee*, from

Cape Palmas, Western Africa, were presented in the name of Dr. George A. Perkins.

A note was read from Mr. Darius Forbes, of Chester, New Hampshire, presenting twenty-one specimens of various minerals from that vicinity. The thanks of the Society were voted for the donation.

Mr. Alger presented to the Society a specimen of Titaniated Quartz, or Quartz containing Rutile in long crystals, known by the name of Venus Hair Stone, from Waterbury, Vermont. Also in the name of Dr. Fuller, one specimen of Prismatic Quartz from Greenwood, Maine.

A specimen of *Falco haliætus* was presented in the name of Mr. George Fowle. The thanks of the Society were voted for the donation.

Mr. Stimson presented several specimens of the teeth of *Carcharias obscurus*, and a number of Algæ.

Mr. Joseph W. Patterson was elected a member of the Society.

October 17, 1849.

The President in the Chair.

Present, thirty-one members.

M. Bureau Riofrey, M. D. from Paris, and Sir John Richardson, present by invitation, were introduced to the Society by the President. Sir John Richardson briefly stated the course he had pursued in his recent northern tour in search of Sir John Franklin. He had traversed the regions visited by him with Sir John Franklin twenty-five years ago for 3,500 miles, and had then followed the shores of the Arctic Ocean for 800 miles. He stated, that the territory north of the St. Lawrence and the great Lakes is equal in extent to the whole United States including the recent additions.

Dr. Gould exhibited several specimens of Lymnæa from Lake Superior.

The distinctions of species in this genus, he said, are very slight and difficult to make out. He, however, was satisfied from a careful examination of the specimens before the Society, that the three species of Say, *L. catascopium*, *L. emarginata*, and *L. pinguis*, are in reality but one.

Dr. Gould, also, exhibited specimens of *Helix hortensis* from a small island near Cape Ann. This species, he remarked, is one of the few land shells which have been introduced into America from Europe. Like the same and other species in Europe, it is extremely prolific, and the island from which the specimens were obtained is covered with them. The true American species of this genus, on the other hand, produce very few offspring, and are comparatively very rare. *Helix hortensis*, as is well known, exhibits very great varieties of marking. The specimens found on one of the islands near Cape Ann are all of the plain variety. On another island, about a mile from this, the banded variety exists in great numbers, the banding in all being precisely the same. It would thus appear that varieties perpetuate themselves.

Prof. Agassiz remarked, that in Europe very different varieties are found in close proximity to each other, as for instance in two adjoining gardens.

Mr. Ayres exhibited to the Society a new species of fish of the genus *Polypterus*, from West Africa, recently presented by Dr. Perkins.

This fish belongs to one of the fossil types, of which several instances exist in America, and of which two have been before described as coming from Africa. It is characterized by the number of finlets on the back, of which in the specimen exhibited there are six, commencing very nearly at half the distance from the head and extending to the tail. The throat is covered with hard, bony plates like the scales on the body, which are nearly immovable. This would greatly embarrass the respiration of the fish, were it not for two openings on the top of the head, which act as safety-valves, allowing the water to flow through them. The specimen exhibited resembles the fossil types also in the unequal size of the lobes of the tail; an unusual form in living species. The abdominal anatomy is very peculiar. On first opening the abdominal cavity there seem to be no organs in it. They are found closely attached to the back bone, and occupy a very small space. Mr. Ayres proposed to call the new species, *P. Palmas.*

Mr. Ayres also stated, that he had found *Cottus variabilis* to be a very common species along the shores of Massachusetts Bay. It had hitherto been considered a rare species and had not been found north of Cape Cod.

With reference to the number of species conforming to the fossil types found in North America, Prof. Agassiz said that he had made out ten distinct species belonging to the genus *Lepisosteus;* five being of the pointed-nosed, and five of the short-nosed variety. These specimens had been brought from various localities, and the distinctions of some of the species, although constant and sufficiently well marked, are so slight that they would probably have escaped detection, had not specimens been carefully compared with each other side by side. An examination of the young of the various species at different stages of growth shows an interesting conformity with the fossil gradations.

Dr. Wyman exhibited a canine tooth of the Engéena, *Troglodytes gorilla* Savage, which had been presented to him by Dr. Savage, but which he had not been able in the absence of perfect specimens to identify till recently.

The whole length of the tooth was 2.8 inches, the crown measuring 1.3; its breadth was 1.0, and its thickness 0.7½. It is slightly recurved, its posterior edge trenchant, and its inner face impressed with two deep grooves, leaving a prominent rounded ridge between them.

Dr. Wyman also gave some account of certain geological appearances which he had recently noticed on the coast of Labrador.

Along the whole shore from the S. E. corner at Wapitiguan to Green Bay, in lat. 52° N., boulders exist in great numbers, both at the water's edge and on the summits of the most elevated hills. Those in the bays, as at Green Bay, were nearly all situated near the low water mark, and may doubtless have been drifted in by the floating ice which makes its appearance on the coast every spring; but a different explanation must be given to account for those on the elevated rocks and hills. Nearly all the protruding rocks are rounded and the marks known as "Drift marks," "Diluvial scratches," and "Glacier marks," existed in great abundance. The smooth and rounded rocks are especially observable at Bras d'Or. They are all rounded on the northern side.

Prof. Agassiz remarked that in Cambridge, on the road to Mount Auburn, there may be seen at the present time, in a recently opened gravel-pit, an instance of the two kinds of drift, one above the other. The upper one is of marine and the lower of glacial origin. The former is made up of different materials, distinctly stratified, and exhibits marks of tidal action, but contains no boulders. The lower one consists of small and large pebbles, more or less scratched, irregularly scattered through a bed of mud.

Dr. Cabot stated, that at Deer Island, in Boston Harbor, a similar drift deposit may be seen.

Mr. Girard read a paper on the genus *Cottus*.

ON THE GENUS COTTUS Auct.

There are in the genus *Cottus*, as it has hitherto been admitted, two groups of species always very easily distinguished from each other at first sight; the head of the one is smooth or nearly so; that of the other is tuberculous, or armed with spines; the former inhabits fresh water, the latter salt or brackish water at the mouths of rivers.

These two groups are generically distinct both by external characters and anatomical structure. It remains only to decide which should retain the name of *Cottus*, and to which it will be necessary to give a new name.

The most simple way to settle this question, will be to go back to the origin of the genus *Cottus* and follow its history.

Artedi established it in 1738 with the following characters: — Gill-membrane containing six distinct bony rays; head larger than the body, depressed and acute. Two dorsal fins; the anterior one composed of flexible spines. Ventral fins small, having only four soft rays. Skin scaleless.*

He places in the first rank the fresh water species having two spines on the head, of which *C. gobio* is the type, being the only one known at that time. Next the species with more spines on the head, including not only the salt water species having a smooth skin instead of scales, but two others which have since become, one the type of the genus *Aspidophorus*, the other, the type of the genus *Callionymus*. Artedi himself went thus beyond the limits of his genus by placing in it the two last species, as their body is covered with scales.

Linnæus† alters Artedi's genus by giving as the only character for it, "a spiny head broader than the body." Linnæus went further; he transposes the species and places at the head *C. cataphractus*, the type of the genus *Aspidophorus*, of later date, and which Artedi placed at the end of the genus *Cottus*. His third species belongs now to the genus *Batrachus*, and the fourth to the genus *Platycephalus*. The *C. gobio* is the last. Fabricius‡ followed the example of Linnæus. Cuvier§ calls the primitive type of the genus *Cottus*, *C. gobio*, from the fresh waters of Europe, in which have been since distinguished several species which were formerly confounded. Cuvier, following Artedi, describes first the fresh water, and next the salt water species. But when the celebrated ichthyologist wrote the history of this genus, he did not find it necessary to separate generically these two groups, although he had already pointed out their principal differences. There were only two fresh water species known, and that imperfectly.

Now that their number is considerably increased, and the study of them has become somewhat more difficult, it seems proper to subdivide the genus *Cottus* of the different authors in the following manner: —

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* Genera Piscium.

† Systema Naturæ, ed. xii.

‡ Fauna Grœnlandica, 1780, 8.

§ Histoire Naturelle des Poissons, vol. iv. 1829, pp. 142, 150.

I propose the name of ACANTHOCOTTUS, for the marine species, which are generally of a larger size than those found in fresh water.* They are characterized by having spines upon each of the opercular bones. The preoperculum itself has several always strongly developed. The surface of the head, and also often the circumference of the orbits, are either armed with spines, or else they are serrated or notched in different ways. The nasal bones are also in most of the species surmounted by a spine or ridge. The head itself is rather higher than broad; sometimes much deformed, with proportionally very large eyes, and a deep occipital depression. The mouth is always more deeply cleft than in the fresh water species, but the dentition, as a whole, is nearly the same. Nostrils double, distant from each other, tubular, the anterior being much larger, the posterior close to the orbit. The body is scaleless; the back is often arched, and the first dorsal fin almost as high as the second. Some species have three, others four, soft rays to the ventral fins. The lateral line runs uninterrupted from the head to the base of the caudal fin.

The American species of this genus are the following: —

ACANTHOCOTTUS GRŒNLANDICUS Grd. — *Cottus Grœnlandicus* CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 185. — RICH. Faun. Bor. Amer. III. 1836, p. 46, and Add. p. 297, Pl. 95, fig. 2. — STORER Rep. 1839, p. 16. — DEKAY, New York Fauna, 1842, p. 54, fig. 10. — STORER, Synops. 1846, p. 53. *Cottus quadricornis* SABINE, App. to Parry's First Voy. 1821. *Cottus scorpius* FABR. Faun. Grœnl. 1780, p. 456. *Cottus variabilis* AYRES, Proc. Bost. Soc. Nat. Hist. I. 1842, p. 68, and Bost. Journ. of Nat. Hist. IV. 1843, p. 259. (Young) — Greenland; Cuvier and Valenciennes. — Davis Strait; Richardson. — Maine and Massachusetts; Storer. — Connecticut; Ayres. — Hellgate (N. Y.); DeKay.

ACANTHOCOTTUS SCORPIOIDES Grd. — *Cottus scorpioides* FABR. Faun. Grœnl. 1780, p. 157. — CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 187. — RICHARDS. Faun. Bor. Amer.

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* With the exception of *C. polaris;* but the specimens which have been observed may not have been full-grown.

III. 1836, p. 47. — STORER, Synops. 1846, p. 54. Greenland; O. Fabricius.

ACANTHOCOTTUS POLARIS Grd. — *Cottus polaris* SABINE, App. to Parry's First Voy. 1821, p. CCXIII. & J. C. Ross, App. to Parry's Third Voy. 1826, LIII. — RICH. Faun. Bor. Amer. III. 1836. p. 43. — STORER, Synops. 1846, p. 55. — Peninsula of Boothia (Ross); Sabine. — Lat. 75°, Shores of North Georgia; Richardson.

ACANTHOCOTTUS POLYACANTHOCEPHALUS Grd. — *Cottus polyacanthocephalus* PALL. Zoögr. Ross. Asiat. 1811, p. 133, Pl. 23. — CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 176. — RICHARDS. Faun. Bor. Amer. III. 1836, p. 48. — STORER, Synops. 1846, p. 55. — Off Cape St. Elias (Billings) 60° lat. N.; Richardson, Valenciennes.

ACANTHOCOTTUS PSITTILIGER Grd. — *Cottus psittiliger* PALL. Zoögr. Ross. Asiat. III. 1811, p. 143, Pl. 20, fig. 3 and 4.— CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 193. — RICH. Faun. Bor. Amer. III. 1836, p. 48. — STORER, Synops. 1846, p. 54. — Unalaska and Harbor of Avatcha; Cuvier and Valenciennes. — Coast of Kamtschatka; Richardson.

ACANTHOCOTTUS HEXACORNIS Grd.—*Cottus hexacornis* RICHARDS. Frank. Journ. 1823, p. 726, & Faun. Bor. Amer. III. 1836, p. 44. — STORER, Synops. 1846, p. 55. — Mouth of Tree River, lat. 67° 12″ N.; Richardson.

ACANTHOCOTTUS POROSUS Grd. — *Cottus porosus* CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 498. — RICH. Faun. Bor. Amer. III. 1836, p. 47. — STORER, Synops. 1846, p. 56. Baffin's Bay; Richardson.

ACANTHOCOTTUS ÆNEUS Grd. — *Cottus æneus* MITCH. Tr. Lit. & Philos. Soc. New York, I. 1815, p. 380. — CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 189. — STORER, Rep. 1839, p. 20. — DEKAY, New-York Fauna, 1842, p. 52, fig. 19. — STORER, Synops. 1846, p. 54. — New York; Mitchill, DeKay. — Massachusetts; Storer.

ACANTHOCOTTUS MITCHILLI Grd. — *Cottus Mitchilli* CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 188. — DEKAY, New York Faun. 1842, p. 53, fig. 46. — STORER, Synops. 1846, p. 56. *Cottus scorpio* MITCH. Tr. Lit. & Philos. Soc. New York, I. 1815, p. 381. — New York; Mitchill, DeKay.

ACANTHOCOTTUS VIRGINIANUS Grd. — *Scorpius Virginianus* WILLUGB. Hist. pisc. App. 1685, p. 25, Pl. 10, fig. 15. *Cottus scorpius* SCHŒPFF, Beobach. &c. VIII. 1788, p. 145. *Cottus octodecemspinosus* MITCH. Tr. Lit. & Philos. Soc. New York, I. 1815, p. 380. — CUV. & VAL. Hist. Nat. Poiss. IV. 1829, p. 181. GRIFF. CUV. X. 1834, Pl. 43, fig. 4 .— RICH. Faun. Bor. Amer. III. 1836, p. 46.—*Cottus Virginianus* STORER, Rep. 1839, p. 18. — DEKAY, New York Faun. 1842, p. 51, fig. 13. — STORER, Synops. 1846, p. 54. Coast of Virginia ; Willugby. — New-York ; Mitchill, DeKay. — Newfoundland ; Richardson.

I have not been able to make the comparative study of the species of this genus as complete as I could desire, not having had sufficient materials at my disposal. I have nevertheless ascertained one fact which I think will not be without interest in the history of the species — namely, that the *C. variabilis* Ayres, is the young of the *A. Grœnlandicus.* This fact shows the importance of studying these fishes throughout their different stages of growth if we wish to arrive at a complete knowledge of the species.

The *C. variabilis*, which was at first believed to be restricted to the shores of Connecticut, has been since found at Chelsea, Massachusetts, by Mr. W. O. Ayres himself; and Mr. Horatio R. Storer brought it the last summer from the shores of Labrador, together with young *A. Virginianus.* The geographical distribution of this species follows therefore that of *A. Grœnlandicus* with which I have identified it by the study of its Zoölogical characters.

The examination of the young Acanthocotti has also apprised me of the fact that the spines of the preoperculum vary within certain limits. Thus I have noticed some individuals which had three spines on one side and two only on the other. It is already known that one of the spines may be occasionally bifurcated, but in the instance above mentioned the third spine was not the result of a division ; their respective position left no doubt with regard to this point.

It would be very interesting to compare authentic specimens of the *C. scorpius*, Fabr. (*A. Grœnlandicus*) with the species of the same name of the coast of New England, Newfoundland,

and Labrador. I cannot help thinking that there are two species confounded under the name of *grœnlandicus*, the comparative study of which will alone enable us to determine. Should they prove to be distinct, the name of *variabilis* could be restored for the species of the western coast of the Atlantic.

Next to the Acanthocottus must be placed the genus TRACHIDERMIS Heckel, characterized by a rough skin, and teeth on the palatine bones ; as for the rest, similar to the foregoing in its general appearance. The body is perhaps more fusiform and the armature of the head and of the opercular apparatus less developed. The head is very depressed, and the mouth deeply cleft. But one species of this genus is known, the *T. fasciatus* Heck.* from the Philippine Islands. It is a fish of a small size.

I shall preserve the name of COTTUS Artedi, for the fresh water species, having but one small spine at the angle of the preoperculum, and sometimes another still smaller, always hidden under the skin and perceptible to the touch only, at the lower margin of the suboperculum. The head itself is very depressed, more or less truncated in front, generally broader than high, but always very uniform, being scarcely detached from the body unless by its more considerable breadth. The mouth is less deeply cleft than in the Acanthocotti. Like the latter they have teeth on the intermaxillaries, on the lower maxillaries and on the front of the vomer. Sometimes at a younger age, the palatine bones are rough, indicating rudimentary teeth ; these bones become smooth in the adult. Nostrils double, as in the Acanthocotti. The body is also smooth, scaleless, and tapering to the tail. The first dorsal is always less high than the second ; the back is but little arched and projects little or not at all above the nape. The ventral fins have three soft rays in some species and four in some others. The lateral line is sometimes interrupted, as in the greater number of American species,† sometimes continuous throughout the total length of the body, as is the case with all the species of the old world.

The generic name of *Uranidea* has been given to a species of the genus Cottus by a mistake of its author. Nevertheless, if the principles of nomenclature had transferred the name of Cottus to the marine species, I should not have created a new one for the fresh water species. I should have adopted the genus Uranidea although unfortunately chosen, knowing how small a number of names have a true etymological signification, and how many are arbitrarily applied. There are in North America : —

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* Annalen des Wiener Museum, Vol. ii. 1837, p. 159, Pl. 9, figs. 1 and 2.

† Mr. Heckel has made of it one of the characters of his *C. gracilis*, the single American species which he saw.

Cottus cognatus Richards. Faun. Bor. Amer. iii. 1836, p. 40. Great Bear Lake ; Sir John Richardson.

Cottus Richardsonii Agass. Lake Superior, 1850, p. 300. Northern shores of Lake Superior ; Prof. Agassiz.

Cottus Bairdii Grd. — *Cottus gobio* Kirtl. Bost. Journ. Nat. Hist. v. 1847, p. 342. — Body subcylindrical, short, mouth comparatively large. — Pennsylvania, tributaries of the Ohio ; Prof. Baird. — Mahoning River ; J. P. Kirtland.

Cottus meridionalis Grd. Resembles the former, but the tail tapers away more suddenly. The mouth is also a little larger. — James River ; Prof. Baird.

Cottus gracilis Heck. Ann. des Wien. Mus. ii. 1837, p. 148. — *Uranidea quiescens* DeKay, New York Fauna, 1842, p. 61, Pl. v. fig. 14. — *Cottus gobio* Ayres, Bost. Journ. Nat. Hist. v. 1845, p. 121, Pl. xi. — New York ; Heckel, DeKay. — Manchester, Connecticut, W. O. Ayres.

Cottus viscosus Hald. Suppl. to a Monogr. of Limn. &c. 1840, p. 3.
Eastern Pennsylvania ; Professors Haldeman and Baird.

Cottus boleoides Grd. Remarkable for its slender body and its largely developed fins.
Windsor, Vt. ; Ed. C. Cabot, Dr. Storer.

Cottus Franklinii Agass. Lake Superior, 1850, p. 303. Eastern and Southern shores of Lake Superior ; Prof. Agassiz.

Cottus gobioides Grd. Body thick and short ; mouth very large. — Burlington, Vt. ; Rev. Z. Thompson, Dr. D. H. Storer.

Cottus Fabricii Grd. — *Cottus gobio* Fabr. Faun. Grœnl. 1780, p. 159. — Greenland ; O. Fabricius.

. . . .

There remains one species which cannot be placed in any of the preceding genera, it is the *C. asper* Rich. from Columbia

River.* Mr. Heckel† had placed it in his genus Trachidermis, where I do not believe that it can remain, notwithstanding its rough skin and its teeth on the palatine bones. Dr. Richardson has felt the necessity of withdrawing it from the genus Cottus. In the "Fauna Boreali Americana," he thought the genus Hemilepidotus might perhaps receive it, but he himself has acknowledged since, that its place was not there, and when establishing the genus Centrodermichthys,‡ for some species of the China seas, he proposed to associate with them the *C. asper*. Not having at my disposal sufficient materials to satisfy myself upon this subject I shall reconsider it in a monograph of the species of Cottus of North America, which I am now engaged in preparing.

Dr. Gould presented, in the name of Capt. Joseph P. Couthouy, a specimen of Volcanic Ammonia, brought home from the United States Exploring Expedition.

Rajinder Datt of Calcutta was chosen a Corresponding member of the Society.

November 7, 1849.

The President in the Chair.

Present, twenty-nine members.

Present, by invitation, M. H. Perley, Esq. of New Brunswick.

Prof. Agassiz said that he had been for some time engaged in the study of the Worms of the coast of Massachusetts, and he had obtained some very interesting results.

He had found that in many of the Annelids which, at an early stage of their development are furnished with a pair of eyes to each ring, these organs gradually disappear, so that at maturity they are either eyeless or there remain but one pair in some species, in others a few, on some of the joints.

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* Faun. Bor. Amer. III. 1836, p. 295, Pl. 95, fig. 1.

† Ann. d. Wien. Mus. II. 1837, p. 162.

‡ Ichthyology of the "Sulphur."

Terebella fulgida, of which Prof. Agassiz exhibited a drawing, had been supposed heretofore to be eyeless. He had recently obtained specimens at various stages of growth with eyes, the number diminishing as the animal approached maturity. Cirratulus, of which he exhibited a figure, he had found to be an immature Terebella. The branchial appendages characterizing it disappear with its development. He had thus been led to the conclusion, at variance with the commonly received opinion, that the *abranchiate* Annelids are the highest type of that class. Hæmatorhœa, of which Prof. Agassiz exhibited a drawing, has very long tentacles, and is filled with blood free in the cavity of the body. It has no blood vessels. The blood is made to accumulate at different points, sometimes bulging out the body at one place, sometimes at another, or distending the tentacles; thus giving a variety of shapes to the animal. This species, which is quite abundant under the stones on the Beach at East Boston, is highly phosphorescent, emitting brilliant sparks when irritated. Its power becomes exhausted, but is renewed when the animal has remained quiet a sufficient length of time.

Prof. Agassiz also exhibited drawings of four new species of Doris, to which he had given the names *diademata, coronata, tenella,* and *pallida ;* also of Placobranchus, and a new species of Canthopsis, for which he proposes the name *C. Harvardiensis;* also of Actæon, a genus never before obtained in America, and which he had found in great numbers in Charles River and the creeks about Cambridge. This animal is of a bright green color, owing to the presence of Chlorophyl, which is soluble in Ether like the Chlorophyl in plants. Prof. Agassiz stated that he had, during the past summer, obtained by dredging off Gay Head, *Melibœa arbuscula ;* a new species to naturalists on this side of the Atlantic, characterized by tentacles like those of Doris, and gills like those of Annelids.

In reply to a question, Prof. Agassiz said that the permanent eyes of the Annelids were furnished with transparent media ; those that disappear are merely pigment spots.

Prof. Wyman said, he questioned whether these latter could be properly denominated eyes.

Mr. Ayres exhibited to the Society drawings of the heads of two male Eels that he had received from Bellows Falls.

The proportions of the specimens differed so much that at first sight they might seem to be of different species, but Mr. Ayres said that he was satisfied they were both the Common American Eel, *Muræna Bostoniensis*. He further stated that all the American eels from localities on the coast of the Atlantic and streams flowing into it, so far as he had examined them, belong to this species. His remarks were corroborated by Dr. Storer, who said that he did not consider the great varieties of color and marking seen in different eels as indicating difference of species.

Dr. Wyman made a report on the cranium of a Manatee, presented to the Society by Dr. George A. Perkins, by whom it was obtained in W. Africa.

This was a cranium of a Manatee of the same species as that referred to in a communication from Dr. Perkins published in the Proceedings of the Society, Vol. II. p. 198. In a note to that communication, the provisional name of *Manatus nasutus* had been given. The cranium in question, though much mutilated, gave positive evidence that the species, as there suggested, was a new one. It is characterized by *a narrow forehead* like that of *M. latirostris*, but is depressed instead of being elevated as in the last named species. *The teeth* are molars $\frac{10}{10}$ $\frac{10}{10}$, of which five on each side are in use; the enamel is smooth and the inner root is grooved on its internal face. The *malar bones* are broader in their zygomatic portions than in either of the other species. The *occipital foramen* is triangular, with rounded angles as in the other members of the genus, but in this species the apex is turned upwards, whereas in all the others it is directed downwards.

Prof. Wyman also gave a description of the arrangement of the cancelli of the bones in various parts of the human skeleton, and explained his view of their adaptation to sustain the weight resting upon them, illustrating it by drawings on the blackboard.

He showed that the cancelli in all those bones that assist in sustaining the weight of the body, or in locomotion, are arranged in definite directions, the directions being those of the reception and transmission of force. The neck of the thigh bone was particularly described, and shown to consist within of cancelli so arranged as to form a framed arch or truss. This structure of the neck of the thigh bone he had not detected in any other animal, except a very slight manifestation of it in the Chimpanzée (*Troglodytes niger*) and the Engéena, (*T. gorilla*) which are the most anthropoid species of the brute creation.

Dr. Gould exhibited to the Society a number of new species of shells from Africa, recently presented by Dr. Perkins.

VAGINULUS LIBERIANUS. V. corpore ovali, elongato, posticè ampliato, fuscato infra pallidiori, maculis inequalibus laceratis nigris utroque asperso et lineâ dorsali mediano pallido notato; soleâ trientem latitudinis adequante, transversè rugosâ; tentaculis parvis oculiferis bulbosis. Long. 2. lat. ½ poll. *Hab.* Liberia.

A smaller and more slender animal than *V. Floridanus.* Its blotches are also larger and less numerous, and occur underneath as well as on the back. In form it compares somewhat with *V. Langsdorfii*, from Brazil, but not in coloring.

SUCCINEA SPURCA. T. parvâ, fragili, virescente, striis laxis, scabris, lutum cumulantibus; spiræ anfr. 3 ventricosis; suturâ profundâ; aperturâ rotundato-ovatâ, trientes duos longitud. testæ adequante; columellâ acutâ, valdè arcuatâ, absque plicâ. Long. $\frac{3}{10}$, lat. $\frac{2}{10}$ poll. *Hab.* Liberia, on the moist sides of water-pits, and in crevices of trees.

Similar to *S. avara* in form and in the peculiarity of becoming invested with an earthy coating. It differs in its paler color, and its more arched columella.

SUCCINEA HELICOIDEA. T. parvâ, latè umbilicatâ, tenui, stramineâ, supra obliquè liratâ, infra lævigatâ; spirâ depressâ, anfr. 3½ rotundatis, ultimo subangulato; aperturâ lunatâ, altâ. Diam. ¼; alt. ½ poll.

A singular shell, whose form and texture would lead us to pronounce it a Helix. But its small number of whorls, and the statement of Dr. Perkins that the animal is very large and sluggish, so that it cannot retract within the shell, would bring it more properly within this genus. The sculpture of its upper and lower faces distinguishes it.

HELIX INDECORATA. T. parva, tenui, orbiculato-depressâ, arcte umbilicatâ, nitidâ, glabrâ, virescente; spirâ depresso-convexâ, anfr. $5\frac{1}{2}$ convexiusculis, ad suturam benè impressam marginatis; subtus convexâ; aperturâ lunatâ, labro acuto. Diam. $\frac{2}{5}$, alt. $\frac{1}{4}$ poll. *Hab.* Liberia.

A very plain species, resembling in form small specimens of *H. ligera;* but in the characters of surface and umbilication it is more like a diminutive *H. inornata.* The whorls revolve more closely in the same space, and form a more dome-shaped spire than the incipient whorls of *H. pellucida.*

HELIX CEREA. T. parvulâ, vix perforatâ, fragili, depresso-orbiculari, lucidâ, nitidâ, albido-straminea; spirâ depresso-conicâ, anfr. 5 convexiusculis ad suturam marginatis; aperturâ lunatâ; labro acuto. Diam. $\frac{1}{4}$; alt. $\frac{1}{4}$ poll. *Hab.* Cape Palmas.

Very similar in its characters to the preceding, but is less than half its size, of a very different color, and the umbilical region differs considerably, especially the reflection of the lip at that part, which does not cover the portion of the umbilicus next the aperture, but turns round at right angles to it. It may be compared to *H. alliaria*, but the umbilic is not half as large. The animal is glossy black and extremely active.

HELIX TALCOSA. T. parvâ, tenui, vix perforatâ, pyramidali, talcosâ, spiraliter acutissimè liratâ, basi glabrâ; spirâ conicâ, anfr. 7 planis, ultimo acutissimè carinato; aperturâ rhomboideo-lunatâ. Diam. $\frac{3}{8}$; axis $\frac{3}{8}$. *Hab.* Cape Palmas, on bark of trees in forests.

Remarkable for its trochoid form and silvery lustre, on account of which it would most likely be pronounced a marine species. *H. Ibuensis* accords well with this, excepting that the sharp revolving lines, about three or four on each whorl, are not mentioned.

BULIMUS MUCIDUS. T. solidulâ, ovatâ, mamillatâ, indentatâ, granuloso-striatâ, flavidâ, longitrorsum strigis interruptis nigris ornatâ; spira ovali, anfr. 6, supernis ventricosis, ultimo abnormali, contracto; suturâ marginatâ et crenulatâ; aperturâ parvâ, rotundato-lunatâ; labro acuto, pallido; columellâ subtruncatâ; fauce nigro et luteo variegato. Axis $1\frac{3}{8}$; lat. $\frac{3}{4}$ poll. *Hab.* Interior of Liberia.

Allied to *B. interstinctus*, from the same region, but much smaller, shorter in proportion, and rather remarkable for the mottling of colors, which causes it to look as if mouldy.

Bulimus infracinctus. T. elongatâ, ovato-conicâ, vix perforatâ, tenui, stramineâ, fasciis duabus badiis basalibus cinctâ; spirâ acutâ, anfr. 6 convexiusculis, ultimo subangulato $\frac{3}{4}$ long. testæ adequante; aperturâ amplâ, obovatâ; labro acuto; columellâ reflexiusculâ, haud appressâ. Long. $\frac{5}{8}$; lat. $\frac{3}{8}$ poll. *Hab.* Taboo and Fishtown, Liberia.

From several similar African shells, this differs in having but two bands, the posterior one fairly entering the aperture so as not to appear at the suture on the other whorls as in *B. neuricus*, *meridionalis*, and *Bengalensis*, from the latter of which it can scarcely be distinguished, except by this peculiarity. Both bands are often wanting.

Achatina ventricosa. T. magnâ, solidâ, conico-ovatâ, ex corneo virescente, longitrorsum obscurè flammulatâ, granoso-reticulatâ; spirâ conicâ, anfr. $6\frac{1}{2}$ convexis, ultimo ventricoso, obtusè carinato; suturâ subcrenulatâ; aperturâ rotundato-ovatâ $\frac{3}{5}$ long. testæ adequante; labro everso intus incrassato, submargine et columellâ nitidè purpureis; columellâ valdè arcuatâ. Long. 5; lat. $3\frac{1}{2}$ poll.; aperturæ long. 3; lat. $1\frac{3}{4}$ poll. *Hab.* Liberia.

Closely allied to *A. purpurea*, but the form is constantly more ventricose, and by comparing an extensive series, including the young, the difference is plainly not accidental. The color is more mixed with green and less conspicuously flammulated, and often flecked with triangular pale spots, and the aperture more of a blood red. Dr. Perkins says it is only found in the interior, while *A. purpurea* is found near the sea.

Achatina balteata. T. tenui, lævi, ovato-conicâ, tenuissimè striatâ, vinosâ argenteo-lineolatâ et fasciâ sub-basali argenteâ semper cinctâ; spirâ conicâ, apice mammillatâ, anf. 7 convexis supernis subgranulosis, ultimo angulato; aperturâ $\frac{2}{5}$ long. testæ, lunatâ; columellâ subrectâ, tenui, modicè truncatâ, albâ rufo marginatâ. Long. $1\frac{5}{8}$; lat. $\frac{7}{8}$ poll. *Hab.* Liberia.

A very peculiar shell, both in its conical form and in its marking. The broad silvery band, which is in itself enough to distinguish it, as well as the delicate revolving threads, resemble the hydrophanous bands, on the Bulimi from the Philippine Islands, but they do not disappear on being wet.

ACHATINA PARITURA. Testâ elongatâ, tenui, nitidâ, dilutè corneâ, longitrorsum concinnè liratâ; spirâ turritâ, ad apicem obtusâ, anfr. 7 convexis, ultimo dimidiam long. testæ adequante; suturâ profundâ; aperturâ angustâ, subauriculatâ; columellâ valdè arcuatâ, involutâ, canalem basalem efformante. Incola vivipara. Long. 1; lat. $\frac{7}{20}$ poll. *Hab.* Buried under leaves or in earth, during the dry season, near the sea, Fishtown, Liberia.

Closely approaches *A. Hugeli*, Pfeif. but is more slender, more obtuse at apex, more coarsely and regularly striate, and with fewer whorls. In numerous specimens of the animal preserved in spirits, the young are plainly seen in the oviduct, already escaped from the egg.

Mr. Sowerby has also described a viviparous Bulimus (Malac. Mag.) which Dr. Perkins also collected at Cape Palmas.

AMNICOLA CILIATA. T. parvâ, elongatâ, imperforatâ, fusco-viridi; spirâ acuto-conicâ, anfr. 6 subangulatis ad angulum serie aculearum recurvarum armatis, ultimo ad peripheriam acutè carinato; aperturâ circulari, labro nigro. Long. $\frac{1}{4}$; lat. $\frac{1}{8}$ poll. *Hab.* Deea River, Liberia, on the muddy margins.

A beautiful little species, grouping with a somewhat larger one from New Zealand, described by me as *Melania corolla*, and a smaller one from Jamaica, found by Prof. Adams, and named by him *M. spinifera.* A further examination of the aperture and operculum, and also the animal of the New Zealand species, satisfies me that they ought all to come under the genus *Amnicola.*

AMPULLARIA BALANOIDEA. T. solidâ, imperforatâ, globosâ, decollatâ, fusco-olivaceâ, fasciis numerosis saturatioribus cinctâ, lineolis undulatis granulosis confertis insculptâ; spirâ elevatâ, anfr. superstitibus duobus ventricosis, ad suturam appressis; aperturâ rotundato-ovatâ, labro acuto; columellâ arcuatâ, planulatâ, croceo tinctâ, fauce castaneo et albido fasciato; operculo tenui. Diam. $\frac{3}{4}$ poll. *Hab.* Grand Cape Mount, Liberia, on rocks in rapid streams.

A small, very solid species, somewhat similar to *A. Storeria*, Jay, from the river Amazon.

TRICHOTROPIS PUSILLUS. T. minutâ, rhomboideâ, umbilico semicirculari perforatâ, albidâ, striis minutis volventibus cinctâ; spirâ conicâ, anfr. 4–5 convexis, ultimo ventricoso et costis elevatis tribus cincto; aperturâ semicirculari; columellâ rectâ, ad planitiem labri acuti trilobati haud assurgente; umbilico semicirculari. Axis $\frac{1}{6}$ poll. *Hab.* Crevices of rocks beaten by surf, at Fishtown, Liberia.

This curious little shell was also collected by the Exploring Expedition, probably at the Cape de Verds. No hairy epidermal processes appear on any of the specimens; yet I cannot doubt that it belongs to the genus where I have placed it.

APLYSIA FIMBRIATA. A species somewhat resembling *A. dactylomela* from South America was collected and figured by Dr. Perkins, without, however, giving the colors. It is about 5 inches long when fully extended, and about $3\frac{1}{2}$ inches across the lobes when quite expanded. The margin of the foot is somewhat corrugated, and the margin of the lobes sinuate. There are 8 or 10 large, black annuli on each side of the exterior of the mantle. The margin of the interior, which is dark, is digitate with white, the digitations being more or less rectangular. The cervical tentacles are small and slender; the cephalic tentacles have a coarsely fringed margin. The calcareous shield is thin and delicate, with a strong epidermis extending beyond its edge; it is obliquely ovate triangular, quite acute at apex.

BULIMUS INTERSTINCTUS, Nob. (Proceed. I. 158.) proves to be very variable in form, and especially in color, being green, brown, ochreous, sometimes spotted, &c. *Bulimus rubicundulus*, Nob. (ibid.) is one of these varieties.

The collection contained several interesting bivalve shells, which may be described on some future occasion.

A fine specimen of quartz crystals was presented in the name of Mr. Thomas A. Dexter. The thanks of the Society were voted for the donation.

Specimens of *Ranus Virginianus*, young, and *Mniotilta discolor*, with the nest and eggs, were presented in the name of Mr. Jillson of Lynn. The thanks of the Society were voted for the donation.

A volume, Description de l'Egypte. Etat Moderne et Histoire Naturelle. Planches 2d Livraison. Folio. Paris. 1812; was presented in the name of Mr. Edward R. Mayo. The thanks of the Society were voted for the donation.

Messrs. M. Wolsey Borland, J. Nelson Borland, and John P. Reynolds were elected members of the Society.

November 21, 1849.

The President in the Chair.

Present, thirty-eight members.

Dr. Pickering exhibited to the Society some specimens of Indian corn, taken from a field in which it had been very thickly sown, as an experiment to ascertain its value as an article of fodder.

The specimens exhibited were in the form of a grass about two feet high, and of about the thickness of a quill, and were interesting as showing what was probably its natural state. Some of the larger specimens would probably have produced seed had they been allowed to grow. The experiment answered fully the purpose for which it was made. Dr. Pickering stated that, in the Fejee Islands he had seen the Sugar cane in a similar condition. So unlike was it to the cultivated cane in appearance, that his companion, an experienced botanist, was not easily persuaded of its identity. Dr. C. T. Jackson said that he had seen Indian corn grown in pure granular quartz, presenting the same appearances.

The President called the attention of the Society to a stuffed skin of an American Manati, and the mounted skeleton of the same animal, which were before them. He stated that there had been long established two species of this animal, one dwelling in the waters of tropical Africa, and the other of America, — *Manatus Senegalensis* and *Americanus*. They belong to the class of herbivorous Cetacea. He proceeded to point out the details of the skeleton, and of its external configuration. The skeleton was nearly complete, lacking only some of the bones of the anterior extremity. He concluded his remarks by presenting the specimens to the Society.

Prof. Agassiz said he could not let the occasion pass without calling the attention of the Society to the great value of the specimens just presented by the President. He stated that the skin was the only one of this animal in any scientific collection. Of the bones, there is one perfect skull, and part of another in the Collection of the Academy of Natural Sciences in Philadelphia; a broken cranium and a few vertebræ and ribs in the Collection of the Medical College in Charleston, S. C. The skeleton was therefore of extreme value.

Prof. Agassiz said that he had, during the past season, been studying the metamorphoses of the Lepidoptera, and had particularly noticed a stage in the transformation of these insects not usually described. Burmeister, however had observed it, but had not made use of the hint which it gave for a natural classification of insects.

The Lepidoptera are known in three conditions, that of the worm, jointed, and furnished with jaws, the chrysalis, and the perfect insect with four wings. The condition which was first noticed by Burmeister is concealed somewhat under the skin of the caterpillar. At a certain period it swells in the thoracic region, becoming extremely sensitive to the touch from an inflammation of the skin in this part. On making an incision at this place, the rudiments of four wings appear before it passes into the chrysalis state. The wings are long enough to extend half the length of the perfect insect. The posterior pair are membranous bags, somewhat flattened like the respiratory vesicles of marine worms, with distinct ribs, which are blood vessels. The anterior pair are also bags with their upper half stiff and inflexible like the elytra of Coleoptera. The legs are tubular, but not jointed as in the perfect insect, and are bent backwards. The jaws are changed into two long tubes, which are bent backwards, as are also the antennæ. In the chrysalis the wings are flattened and soldered together, as are the legs and sucking tubes. The order of development of the different parts, and the coleopterous condition at an incomplete stage, show that naturalists have been in error in placing chewing insects, as the Coleoptera, above the sucking insects. The order should be reversed. These observations may be confirmed by examining specimens just at the moment when the skin begins to split on the back. Prof. Agassiz exhibited drawings illustrating all the conditions described.

Dr. Gould presented descriptions, and exhibited drawings of several new species of the naked mollusks of the vicinity of Boston.

Mr. Desor communicated some observations made by Mr. Whitney and himself in reference to the probable origin of the so-called fossil rain drops, which, in this country, are found on slabs of New Red Sandstone, as well as Potsdam Sandstone.

He said it had already been noticed by Mr. Teschemacher that these so-called rain drops, when closely examined, are found to differ in several respects from the impressions made by the rain on a beach, where each drop produces an impression surrounded by a rough crest, more or less elevated according to the force of the rain. The fossil impressions on Sandstone, on the contrary, are generally flat and smooth. Besides, there is hardly a shower in which the rain drops are not numerous enough to cover the whole or nearly the whole ground, whereas the fossil impressions are generally scattered and so few in number that it seems almost impossible to ascribe them to rain.

Mr. Desor said, that whilst encamped on the border of Lake

Superior, they had several opportunities of studying the action of the waves on the beach during a heavy surf, when they are driven beyond their usual range. It was noticed that when the waves retired from the higher part of the beach, where the slope was less steep, there could be seen several kinds of impressions in the act of forming, some large and flat, others small and deep, (like those which on the sea-shore are generally ascribed to worms or shrimps,) and others likewise deep, but surrounded by a sort of annular, smooth rim. These different kinds of impressions are all produced by the same cause, operating in the same way, namely, air bubbles, which are formed in the waves of the surf, when rolling over the beach. If an air bubble becomes buried in the sand, so that in order to escape it has to make its way through the new-formed stratum of sand, it forms a deep and narrow hole. If the air, instead of escaping at once, bubbles up several times, then it raises around the hole a small and smooth rim, which may be compared to a miniature crater of a volcano. If, on the contrary, the air bubble remains at the surface and bursts, then it causes a flat and rather large impression. According to Messrs. Whitney and Desor, these different forms of impression arising from air bubbles, are sufficient to account for most impressions which have hitherto been considered as the effect of rain. Such impressions of air bubbles are most perfect where the slope of the beach is very gentle. Where the slope is more or less steep, the sand becomes too much hardened under the pressure of the waves to allow these delicate impressions to be produced.

A sketch was exhibited, showing these different forms of impressions, and their striking contrast with impressions of rain drops from the same beach, mouth of Carp River, Lake Superior.

Mr. Teschemacher said, that he had seen fossil rain drops, so called, with an elevated ridge crossing them; an appearance easily explained by Mr. Desor's hypothesis, but incompatible with the supposition that they were caused by rain.

Prof. Agassiz said, that on the mud flats at Cambridge, he had noticed impressions made in the way described by Mr. Desor at Lake Superior.

Prof. Rogers thought that in the bursting of a rain drop a similar process to that described by Mr. Desor might take place. The drop might enclose a bubble of air beneath it, which bursting would give rise to the appearances in question. He thought the explanation of Mr. Desor very important, as indicating that the surface covered with these impressions was subaqueous and not subaerial.

Mr. Desor showed also sketches of foot-marks from the same beach.

The impressions bear a striking resemblance to certain foot-marks in the new Red Sandstone of the Connecticut Valley, where there is seen, besides the mark of the hind toe, an impression like that of the tarsal bone. But as there are no birds (with the exception of some web-footed birds) that walk in this way, those strange foot-marks have been ascribed to some kind of reptiles. M. Desor said, that similar impressions are made by the ravens when walking slowly and carelessly, as they do over a beach. They then generally touch the soil with the nail of their hind toe before they rest their foot, and thus produce an impression which looks exactly as if it had been produced by the tarsal bone. Sometimes, also, the raven, in raising the foot, drags along the middle toe, and thus causes a very peculiar track.

M. Desor made, also, some remarks upon a layer of Potsdam Sandstone from the falls of the river Saint Croix.

It is filled with fossils, being for the most part Lingula and Orbicula, together with some Trilobites. This stratum lies eight hundred feet lower than that in which the species described by Mr. Hall occur, and is therefore the oldest fossiliferous rock known in the country. A specimen of it was presented to the Society by Mr. Desor, on which there are seen a few specimens of a species of Lingula described recently by Dr. Owen.

Dr. Burnett read an essay on "Cell Types, as forming the Bases of all the higher organic Types."

The purport of the paper was to show the probability that the characteristic type of every animal organism exists in the primitive cell; and that future improvements in the microscope would enable naturalists to make out at once the distinguishing features of each in the simple elementary cell. The conclusion of the essay was as follows: —

> It is, therefore, very desirable that embryologists, instead of devoting all their time to Embryonic Developments *from* cells, should pay especial attention to the origin and development of these embryonic cells in the different classes of animals; for it is by this means only that their peculiarities can become known. And when Embryology shall have become as rich in details of this kind as it now is in those relating to structural formation, the advantage thereby gained not only to Comparative Physiology but to Comparative Anatomy, will not at all be exaggerated, when it is affirmed that *then* we shall have arrived not only at the foundation of all classification of animal structures, but shall have become more intimately acquainted with the ideas on which the Deity built up these ever-varied forms.

Dr. Wyman exhibited preparations of the foot of a species of Musk, (*Moschus* ———).

It presented an intermediate condition between the feet of typical Ruminants and the even-toed Pachyderms. The metacarpal bone of the two principal toes was deeply grooved before and behind, indicating its former subdivision — a subdivision which exists in all Ruminants, during the embryonic period. The two lateral metacarpal bones, though quite slender, extend from the carpus to the level of the central ones. This conformation assists in supporting the view first announced, but never adopted, by Cuvier, and quite recently made a basis of classification by Prof. Owen; the Ruminants falling into the same group with the *even-toed* (Artio-dactyl) Ungulates.

Prof. Agassiz expressed great interest in the remarks of Dr. Wyman, and said that he should venture to predict that the feet of embryo ruminants would be found to present a similar structure to that described by him. He had taken steps preparatory to investigating the subject.

The Treasurer announced to the Society that within the past month the munificent donation of $2,000 had been received from Jonathan Phillips, Esq. of Boston. By this timely liberality the debts of the Society had been paid, and he had now the satisfaction of stating that it was free from all encumbrances.

The following additions to the Cabinet were announced. Mounted skeleton of an Ant Eater, purchased; skeleton of a Greyhound, presented by Dr. Shurtleff; skeleton of a Jackall, from W. S. Bullard; skeleton of a South American Squirrel, from Col. Jaques of Charlestown; a Dolphin, *Coryphœna globiceps* was presented in the name of Mr. Benjamin Abrahams of Boston. A specimen of Arborescent oxyde of Manganese from a quarry in Newton, Mass., presented by Mr. E. C. Dyer. Thirty-eight bird skins, presented by Dr. F. W. Cragin of Surinam; a number of mounted birds received from Europe in exchange for specimens formerly presented by Mr. Gassett; one mounted bird presented, and two deposited, by Mr. F. J. Bumstead; a specimen of *Plectrophanes laponicus*, Lapland Longspur, obtained at Gloucester, the first of this species ever obtained in Massachusetts, presented by ——— ———.

The thanks of the Society were voted to those donors of the above specimens who were not members.

Messrs. J. M. Barnard, James Lawrence, and Edmund Dwight of Boston, were elected members of the Society. Dr. Henry G. Dalton of Demerara, was elected a Corresponding member.

December 5, 1849.

The President in the Chair.

Thirty members present, and several gentlemen by invitation.

The Secretary being absent, Dr. Kneeland was appointed Secretary, *pro tem.*

The President exhibited and explained a cast of the *Plesiosaurus dolichodeirus,* seven feet in length ; he thought it would be more interesting and useful to the Society than to himself, and accordingly presented it to the Society.

He remarked that the fossil Saurians were comparatively unknown till about the year 1770, at which time the attention of naturalists was arrested by the discovery, near Mäestricht, of a supposed new fossil animal; this specimen established the genus *Mososaurus*, of which he exhibited plates; the specimen is still at Paris. Next, Everard Home described another fossil genus of Saurians, to which Charles Koënig, of the British Museum, gave the name of *Ichthyosaurus*. Then the *Plesiosaurus*, *Protosaurus*, *Megalosaurus*, &c. were discovered. Of the several genera there are already many species, and these are still increasing; there are already sixteen or seventeen species of *Plesiosaurus*. This cast shows the assemblage of parts seemingly of a variety of animals, as the lizard's head, crocodile's teeth, bird's neck, chameleon's ribs, whale's paddles, &c. He exhibited the head of the *Icthyosaurus*, showing the arrangement of bones, which gives the spring-like action to the lower jaw. The dorsal vertebræ of the *Plesiosaurus* resemble those of a fish, but their concavity is less than those of the *Icthyosaurus*; the sternum, shoulder, humerus, and forearm are quite perfect; the head is imperfect; unlike the *Cetacea*, they have a well-formed pelvis ; the lower extremities are well preserved.

Rev. Zadock Thompson, of Burlington, Vt., exhibited some of the bones of a Cetacean, recently found near Rutland, on the line of the railroad from Burlington to Bellows Falls.

The discovery of the remains of Cetacea and Elephants among the Green Mountains is an instance of the great benefit railroads have been to the lovers of science, in bringing to view the earth's strata, and their fossil remains. In 1848, in a deep muck bed on Mount Holly, were found a large tooth, two tusks, and other bones, which have proved to be bones of a fossil elephant; one tusk was seven feet long, so that the animal must have been a large one. In August, 1849, in Charlotte, (a few miles from Burlington, Vt.) some bones were found in a fine adhesive blue clay: an anterior extremity, portions of a head, some vertebræ and ribs, of an animal which Mr. Thompson thought must be either cetacean or saurian. A careful examination satisfied him that from the convex surfaces of the vertebræ, and the impossibility of any but a vertical motion, the animal must have had a horizontal tail; he afterwards found the blow holes, and was sure that it belonged to the whale family: one bone, which was very hard to place, was found by Prof. Agassiz to be the vomer. Mr. Thompson thinks it is not an extinct species; it resembles very much Cuvier's Arctic Whale (Baluga ?) if it is not this very species. It was found one mile east of Lake Champlain, sixty feet above the level of the Lake, and one hundred and fifty above the level of the sea; the soil here is of stratified clay and sand, containing many marine shells; some of which were exhibited, though broken; Sanguinolaria, &c. The clay was not here stratified, however, and was so soft that if it had been so deposited the stratification would have disappeared; the bones were found in a kind of quagmire, eight feet below the surface; below the clay were rounded pebbles; whether they were imbedded in it or not he was unable to say; in the clay were also found vegetable remains, reeds, &c. near the animal, as if it had been buried in a reedy swamp. The greater part of the cranium was found, one half of the lower jaw, most of the vertebræ, (forty-three,) both scapulæ, a humerus and forearms, one long rib, anterior rib, ribs in pieces, hyoid bone, sternum (very large,) some of the teeth, and bones of the ear.

Prof. Agassiz read a paper on the circulation and digestion in the lower animals, showing that the circulation in the Invertebrata cannot be compared to that of the Vertebrata.

Instead of the three conditions of chyme, chyle, and blood, which the circulating fluid of the Vertebrata undergoes, the blood of that class of the Invertebrata, which he had particularly studied, the Annelida, is, according to Wagner, simple chyle, colored chyle; the receptacles of chyle in different parts of the body are true lymphatic hearts like those found in the Vertebrata; this kind of circulation is found in the Articulata and

Mollusks with few exceptions, some Echinoderms, &c. In the Medusæ and Polyps, instead of chyle, chyme mixed with water is circulated; this circulation is found in some Mollusks and intestinal worms; it may be seen plainly in Beroë. Prof. Agassiz thinks that the embryological development of the higher animals shows a similar succession in the circulating function. He also examined the connection of respiration with the circulation; in Vertebrata, the gills are found between branches of the blood system; in Invertebrata, the chyliferous system is acted on by the respiration; the gills of fishes, then, cannot be compared to the gills of Crustacea, Articulata, and Mollusks. No gills are connected with the chymiferous circulation; animals having this circulation have no true respiration; they have only tubes to distribute freshly aërated water to the different parts of the body.

Mr. Desor alluded to a fine skeleton of a Mastodon, which he had lately seen at Galena, Mo., taken from the depth of seventy feet.

It has been thought that this specimen is from the true drift; but it was found in a deposit mixed with drift materials, which he considered subsequent to the true drift. This is not, therefore, a clear instance of the Mastodon in the drift. In reply to a question from the President as to the size of the skeleton, he remarked that one of the tusks was three inches in diameter, and must have belonged to a large animal; the teeth were fine.

Mr. Desor also made some remarks on the sand dunes of Lake Superior, which were first brought into notice by Mr. Schoolcraft.

According to him, some of these dunes are three hundred and fifty feet high. They are not formed like those at Provincetown, but belong to the true drift; there is a clear line of demarcation between the drift sand and the red clay. The whole ground was once covered with trees, which, having been removed probably either by wind or water, the sand has been blown to the eastward by the prevailing northwest wind, forming dunes about four miles below the present limit of the wooded clay. The Grand Sable is three hundred and fifty feet high.

Mr. Edward Cabot presented a rock, found in Brookline, consisting of pudding stone under sandstone.

It presented on its surface several parallel ripple marks of great regularity. He did not think them artificial, as it was a stone little used in the arts. Some gentlemen supposed them artificial, from the curve being the same in each groove, and from the worn appearance of the pebbles. Mr. Bouvé thought they were true ripple marks from the appearance of the curves, being more depressed on one side than the other, from the substance being fine at the surface and coarse at the bottom. Mr. Whitney and Mr. Desor remarked that such ripple marks are very common, and may be seen forming under our very eyes on the shores of Lake Superior.

Dr. Cabot announced the addition to the Cabinet of sixty-four mounted birds. Among them were two specimens of *Buteo Pennsylvanicus*, old and young, the first procured in this State, except one by Dr. Shurtleff at Westfield ; *Strix pratincola*, the common barn-owl, from Surinam, presented by Dr. Cragin ; it resembles the *S. Javanica* more than *flammea ;* the tarsi are larger, and the spots on the breast more distinct. He also alluded to the resemblance of *Picus tridactylus* to *P. hirsutus* and *P. arcticus*, as shown by specimens of the three birds. Mr. Gray has made the *Parus Hudsonicus* only a stage of plumage of *P. atricapillus ;* Dr. Cabot could see no good reason for this opinion ; we have the latter here in every stage of plumage, and it never resembles the former. Mr. Eliot Cabot remarked that the habits and note of these two birds are entirely different, and that he should think it hardly possible to confound them.

Dr. Storer presented, on behalf of Capt. Atwood, a specimen of *Seriola zonata*, which is exceedingly rare north of Cape Cod. Dr. Kneeland announced the addition to the Cabinet of mounted skeletons of *Rhea Americana*, *Pelecanus Americanus*, a species of *Stercorarius*, *Mustela lutreola*, *Bradypus tridactylus*, and *Boa*.

December 19, 1849.

The President in the Chair.

Present, forty members and gentlemen by invitation.

The President presented to the Society a cast of a cranium of a young Mastodon. He pointed out the distinguishing features indicating its age. The principal of these was the number of tubercles belonging to the teeth. The animal had passed its earliest period, as was shown by the absence of the first and second teeth, which had been shed. The original cranium was obtained in New Jersey.

Prof. Agassiz said he would avail himself of the juxtaposition of the Mastodon cranium and the skeleton of the Manatee recently presented, to point out some points of resemblance between them.

The Manatee, he said, has been improperly considered a Cetacean. It differs from these in the form of the skull, which is elongated, and in the position of the nostrils, which are in front. On the other hand the skull resembles that of the elephant in form, particularly when seen from above, in some of the details of the facial bones, as in the zygomatic arches, which are unlike those of Cetacea, in the palatine bones and the arrangement of the teeth, and in the curve of the lower jaw. Blainville has hinted that Cuvier's order Cetacea includes two distinct types of animals. Prof. Agassiz said he would add that he believed the Manatee to be the true embryonic type of the Pachyderms.

Prof. Agassiz said, that having pointed out to the Society, at a previous meeting, the difference of type in the circulating system of different classes of animals, he now proposed to demonstrate a similar difference in the respiratory system.

It was unphilosophical, he said, to speak of the organs of respiration as only of two kinds, lungs and gills. Among the

Invertebrata there are none with more highly developed gills, as they are called, than Crustacea. They are generally regarded as *appendages* to the legs, but in reality they form an essential part of them. In the lower orders of Crustacea the respiratory fringes are attached to the last joint of the legs; but higher up in the series they approach nearer the body, and in the highest of the class they are found on the hip joints. In fishes the gills are placed on branchial arches, the inner surface being a portion of the alimentary canal. In the higher Crustacea the breathing apparatus consists of hollow cones, with numerous little sacs branching from them in many rows, over the inner surface of which the venous blood is distributed by a capillary network of vessels. This venous blood is not sent *from* the heart as in fishes but from a sac at the base of each gill, into which it returns from the body. Having become arterialized it flows *into* the heart from the gills. Thus in anatomical structure and in function these organs are essentially different from those known by the same name in fishes.

Mr. Whitney gave an account of his labors during the past summer as United States Geologist in the survey of the Government lands on Lake Superior.

The surveying party, he said, had confined their labors the present year to the exploration of the mineral lands of that region. He exhibited his maps, so far as they were completed, of that country, showing the geography of the copper district, and gave a brief outline of the geological formation of the country between Lakes Superior and Michigan. The copper district extends from Kewenaw Point to Montreal River. Numerous old workings are found, usually in the richest veins, above which trees are growing several hundred years old. Tradition gives no account of the race which has left these traces of their labors. At Minesota location, at the depth of fifteen feet from the surface, a mass of copper has been found weighing seven and a half tons, which had been raised from its position to the height of two feet, by means of wedges, portions of which still remain. The copper showed marks of the stone hammers used by the miners, of which a large number were found in the hole above the mass, more or less broken. These hammers resemble those of the Indians in other parts of the country, consisting of oval pieces of stone flattened on the sides, with a transverse groove for the attachment of a handle; some of them weighed forty pounds. From the quantity of charcoal found in these old workings, it is probable that the mining process employed was that used by nations of antiquity, namely, that of heating the rock enclosing the metal, by building fires about it, and dashing on water when heated, causing it to split by the sudden contraction. Near the Minesota location is a mound, probably artificial, fifteen feet square, similar in appearance to the Ohio mounds. It is a reasonable supposition, that it was built by the same race, and that they were also the workers in the neighboring copper mines.

Mr. Foster stated, that in the Ohio mounds mica is found six hundred miles from the source from which it must have come, and rings of copper which must have been brought from Lake Superior; also stone hammers similar to those found at the workings. Mr. Whitney remarked that analysis of the copper would show at once whether it came from this locality, but he had not yet been able to procure a specimen for this purpose.

Mr. Whitney also gave an account of the immense deposits of iron ore near Lake Superior. It exists in the form mostly of fine-grained, almost chemically pure peroxyd. It occupies about eighty quarter sections of the mineral country, and at the nearest point is about twelve miles from the Lake. The quantity of the ore is beyond calculation, and the iron made from it is equal to the best Swedish. It appears in the form of solid ridges and knobs, evidently of igneous origin, the highest being about eleven hundred feet above the level of the Lake, and some of them being half a mile long. The cost of the iron when manufactured is from twenty-four to thirty dollars; the price of Swedish is about ninety dollars. The forest in the vicinity of the ore affords abundant materials for charcoal for smelting purposes.

Mr. Whitney exhibited to the Society a specimen of banded jasper and peroxyd of iron from a knob eleven hundred feet above Lake Superior, presenting a beautifully contrasted appearance. The whole mass was similarly constituted. It has been suggested that it might be useful for ornamental purposes. He concluded his remarks with a graphic account of the Pictured Rocks of Lake Superior, which he thought would in time become objects of general interest and resort from their picturesque forms. The name is derived from the brilliant colors in stripes upon their surface, caused by the washing over it of various mineral oxides imbedded in them. Mr. Whitney exhibited several drawings of these rocks.

In reply to questions from Messrs. Teschemacher and Bouvè, Mr. Whitney said, that there is no new red Sandstone in the region he had surveyed, nor any deposit so recent, or near it in geological age. The age of the Sandstone at St. Croix River was inferred from its dipping under the lower magnesian limestone as it does in several other places.

Mr. Desor stated that the Sandstone which is considered the Potsdam Sandstone begins south of the Montreal River. The deposit containing Lingula is far to the southwest at a point near the Upper Mississippi.

Dr. Kneeland read a report on the skulls of the four Hindoo castes, recently presented to the Society. After giving a sketch of the general characteristics of the Hindoo race, with the views of authors as to their probable origin, he proceeded to give a carefully prepared and detailed account of each of the skulls.

The specimens were, crania of a Bramin, Rajah, Boydey, and Kayastha. In addition, Dr. Kneeland exhibited five Hindoo crania, of the lowest caste, belonging to Dr. Minot and one belonging to the Society. He gave a table in which the facial angle and numerous other measurements of the crania were laid down. The average facial angle of thirteen skulls is 76½°. Dr. Morton, in his recently published catalogue of skulls gives as the average internal capacity of thirty-one adult skulls 79.7. The addition of thirteen more here gives an average of 79.5 for forty-four skulls.

From his examination of these skulls and such slight information as can be found in books, Dr. Kneeland said that the Hindoo skull may be distinguished by the following signs, no one being peculiar to this type, but the combination of them not being found in any other race.

Skull very small; bones light, thin, and translucent; shape, oval; forehead narrow, low, and retreating; remarkable depression at anterior inferior angles of parietal bones, and flatness of posterior inferior angles of the same bones. Coronal region well developed; prominence at anterior portion of sagittal suture, flatness at posterior portion. Superior portion of occipital bone prominent, inferior, flat; want of symmetry between two sides of hind-head, foramen magnum rather long than wide, temporal fossa moderate; very distinct and open sutures. Considerable development of the face, nose prominent, with small aperture, orbits large and deep, less than an inch apart; malar bones not projecting by the norma verticalis, though lines drawn from the zygomatic arches touching the temporal bones are not parallel as in the typical Caucasian; incisive portion of superior maxillary bone quite prominent, with slanting direction of incisors, which diminishes the facial angle to less than 80°; downward elongation and eversion of alveolar portion of same bone, giving a deep but wide form to the hard palate. Teeth much worn, generally sound; lower incisors frequently filed, chin prominent, considerable expansion and outward eversion of angles of lower jaw; and upper jaw more prominent than the lower.

Measurements of the ten Hindoo Skulls.

	F. A.	I. C.	L. D.	P. D.	F. D.	V. D.	I. M. Arch.	I. M. Line.	Oc.F. A.	H. P.
Bramin,	71°	cub. in. 78.	6.7	5.0	4.2	5.0	13.8	3.8	13.7	18.6
Rajah,	79°	92.	7.1	5.6	4.6	5.6	15.0	4.5	15.0	20.5
Boydey,	74°	70.	6.8	4.9	4.3	5.0	13.7	3.9	14.1	18.8
Kayastha,	74°	68.	6.8	4.6	4.3	4.7	13.2	3.7	13.9	18.7
4th Caste,	74°	82.	6.8	5.4	4.6	5.1	15.0	4.2	14.4	19.8
"	74°	72.	6.5	5.3	4.4	4.7	15.0	4.0	13.6	18.6
"	70°	66.5	6.6	5.1	4.2	4.4	14.0	3.6	13.5	18.7
"	75°	86.	7.3	5.1	4.3	5.0	15.1	4.1	15.1	20.0
"	80°	67.5	6.8	4.7	4.1	4.8	13.7	3.8	14.0	18.5
"	—	66.5	6.5	5.	3.8	4.8	3 8	4.	13.5	18 2
Average,	74.5°	74.8	6.8	5.1	4.3	4.9	14.2	4.	14.1	19.

The following shells from the Exploring Expedition were described by Dr. Gould.

Pholas patula. T. oblonga, papyracea, alba, inequilateralis, concentricè undato-striata, constrictione mediano partita; latere antico triangulari, radiatim costato, costis ad undas tuberculiferis; latere postico subquadrato, inermi: margine cardinali revoluto, umbonem tegente sed non adnato, callum dentiformem gerente: cochleâ subulatâ, arcuatâ: cavitate ad undas, costas et tuberculos indentato. Long. 3; lat. $1\frac{4}{5}$; alt. $1\frac{4}{5}$ poll. *Hab.* Philippine Islands.

The shell most nearly approaching to this is *P. latissima*, Sowb., and possibly may be the same species. It also resembles *P. truncata*. It is remarkable for the breadth of the valves.

Solen scalprum. Testa transversa, oblonga, retrorsum dilatata, valdè inequilateralis, tenuis, lucida, epidermide flavo-viridi, nitido, iridescente induta; latere antico sub-acuto, obliquè rotundato; latere postico semicirculari: cardo dentibus duobus contiguis, divergentibus in v. dextrâ; dente subulato, arcuato in v. sinistrâ; margine cardinali costâ albâ submarginali suffulto: interior albida. Long. $1\frac{3}{4}$; lat. $\frac{5}{8}$; alt. $\frac{3}{10}$ poll. *Hab.* Singapore.

Allied to *Solecurtus costatus* and *radiatus*. The hinge margin is fortified by a thickening, and indeed there is the vestige of a rib passing from the beak to the ventral margin.

Solen sicarius. T. transversa, oblonga, retrorsum angustata, sub-falcata, epidermide crasso, nitido, corneo induta, anticè obliquè truncata, posticè rotundata: valvis valdè excavatis, undulatis, areis triangularibus indistinctè partitis; margine dorsali recto; m. ventrali arcuato; natibus terminalibus: cardo dente triangulari, erecto, recurvo in utrâque valvâ instructa. Long. $3\frac{1}{2}$; lat. $\frac{7}{20}$; alt. $\frac{9}{10}$ poll. *Hab.* Straits of De Fuca, Oregon.

The only species to which this bears any resemblance is *S. viridis*, which has nearly the same hinge and general form, but which is a more delicate and more slender shell.

Panopæa antarctica. T. subquadrata crassa, alba, rudis, concentricè undata, posticè truncata, anticè angustata et rotundata; margine cardinali erecto, margine ventrali arcuato; umbonibus latis, elevatis, ferè medianis: cardo dente parvo, conico instructa: sinu palleali lato, arcuato, minimè impresso; cicatrice musculari posticâ discretâ, crescentiformi. Long. 2½; alt. 2; lat. 1½. *Hab.* Rio Negro, Patagonia.

Besides being destitute of ribs, it is more nearly equilateral than *P. arctica*, and has the beaks more posterior. It is less gaping, and the posterior truncation is scarcely oblique.

Panopæa generosa. Testa magna, ponderosa, calcarea, sub-quadrilateralis, concentricè unduloso-plicosa, epidermide flavido, rugoso induta, anticè rotundata, posticè truncata et valdè hians; umbonibus submedianis, acutis, elevatis, undulatis: cardo gracilis, dente elevato obliquè triangulari instructus: cavitas ad apicem profunda; cicatrice musculari lato, benè impresso; sinu siphonali minimè profundo. Long. 6; alt. 4; lat. 3 poll. *Hab.* Puget Sound, Oregon.

This large species stands by the side of *P. Aldrovandi*, but is distinguished by the form of the anterior extremity.

Mya præcisa. T. *M. truncatæ* similis, calcarea, epidermide corneo induta, ovata, anticè rotundata et ventricosa, posticè angustata, compressa et truncata; cardo dente trapezoideo, latiore quam elevato, posticè declivo instructa; lineâ palleali angustâ, crenatâ; sinu siphonali profundo, arcuato; cicatrice anteriori elongato, falciformi. Long. 2½; lat. 1; alt. 1¾ poll. *Hab.* Puget Sound.

Differs from *M. truncata* in being more narrowed posteriorly, more rounded anteriorly, more inflated at the umbonal slope, in its narrow palleal impression and deeper siphonal sinus, and more particularly in having the tooth slope backwards.

Mactra deluta. T. tumida, ovato-rotundata, hiantissima, sordida, epidermide tenui deluto, obliquè corrugato induta, concentricè undulata; umbonibus submedianis, tumidis, incumbentibus, contiguis; margine dorsali utroque declivi; margine ventrali rotundato; lateribus obtusis: cardinis foveâ ligamentali profundâ; dente V-formi gracili, ramis inequalibus; dentibus lateralibus brevibus, trigonis, compressis; sinu siphonali propè centrum valvæ obducto. Long. 1⅞; alt. 1⁶⁄₈; lat. 1¹⁄₁₀ poll. *Hab.* New Zealand.

The external appearance is rather that of a rude Venus, and has fewer angularities than any other Mactra. It is also peculiar for its very wide gape.

Mactra cuneola. T. parva, crassiuscula, rudis, ovato-cuneata, albida, epidermide stramineo induta, concentricè striata; umbonibus submedianis, tumidis, acutis, anteversis; latere antico angustato, subacuto; latere siphonali breviori, tumidiori, subtruncato: area cardinalis minima; foveâ ligamentali indistinctâ; dente V-formi conspicuo; dentibus lateralibus curtis, elevatis; sinu siphonali minimo, quadrantem testæ solum transeunte. Long. $\frac{5}{8}$; alt. $\frac{1}{2}$; lat. $\frac{3}{10}$ poll. *Hab.* Callao.

In most of its characters it corresponds with our *M. lateralis;* but in this shell it is the posterior end which is shortest and broadest, while the reverse is the case in that species.

Mactra marcida. T. ventricosa, ovato-triangularis, cretacea, epidermide tenui stramineo induta; umbonibus medianis, tumidis, remotis, vix anteversis; latere antico breviori, rotundato; latere siphonali subtriangulato, acuto; margine ventrali arcuato: fovea ligamentalis ampla, dente V-formi parvo, prominente; dentibus lateralibus crassis, parum elevatis: interior cretacea; sinu siphonali parvo, trientem testæ attingente. Long. $2\frac{3}{4}$; alt. $2\frac{1}{4}$; lat. $1\frac{1}{2}$ poll. *Hab.* Orange Harbor.

This species has precisely the form of *M. lactea*, but is a much more solid and rude shell, wanting also the decided dorsal angularities of the umbones.

Mactra falcata. Testa magna, transversa, ovato-trigona, inequilateralis, convexiuscula, modicè hians, albida, epidermide fulvo, nitido, concentricè rugoso induta; umbonibus acutis, approximatis; latere antico acuminato; latere siphonali latè rotundato, sub-truncato; margine dorsali recto; areâ dorsali planulatâ, lanceolatâ; margine ventrali leniter arcuato: area cardinalis ampla; fossâ ligamentali magnâ, dente V-formi parvo, crasso; dentibus lateralibus compressis, quorum antico valvæ dextræ bilobato: interior lactea; sinu siphonali angusto, elongato, spatulato. Long. $3\frac{3}{4}$; alt. $2\frac{1}{2}$; lat. $1\frac{1}{8}$ poll. *Hab.* Puget Sound, Oregon.

This fine species compares best with *M. Brasiliana* and *M. ovalis.* Its external form corresponds closely with the former, while the narrow siphonal sinus and the hinge closely resemble the latter. The bilobed lateral tooth is quite peculiar.

Lutraria capax. Testa magnifica, ventricosa, ovato-rotundata, anticè rotundata, posticè sub-triangularis, truncata, valdè hians, concentricè undulato-striata, epidermide luteo-viridi (post costam medianum radiatim corrugato) induta; umbonibus tumidis, incumbentibus, attigentibus: cardo validus; foveâ latâ, obliquè triangulari; dente cardinali crasso, erecto, plicato, basi appendiculato; dentibus lateralibus compressis, conspicuis. Interior calcarea; sinu siphonali linguiformi, dimidiam longitudinis testæ attigente. Long. $5\frac{3}{4}$; alt. 4; lat. 3 poll. *Hab.* Puget Sound.

No other species approaches this in size and capacity.

Mesodesma munda. T. parva, solidula, convexiuscula, ovato-triangularis, lævis, epidermide stramineo induta; natibus post-medianis, acutis; margine dorsali vix arcuato, posticè subitò declivi; latere antico angustato, acuto; latere postico rotundato; margine ventrali valdè arcuato. Interior flavescens, cicatricibus impressis: cardo dentibus validis instructus. Long. $\frac{3}{4}$; alt. $\frac{5}{8}$; lat. $\frac{3}{10}$ poll. *Hab.* Mangsi.

Distinguished from *M. striata* by its more compressed, less angular form, its short, broad, rounded anterior end, there being no angle except at the beaks, and by its smooth surface.

Pandora cistula. Testa solida, alba, valdè inequilateralis, falciformis, anticè rotundata, posticè angustata, truncata: valva plana tenuis, submargaritacea, concentricè undulata; margine dorsali subrecto, latè inflecto, unidentato, dente brevi, elevato, triangulari munito: valva concava solidior, ossea, tumida, posticè costato-angulata, edentula, fossâ ligamentali et costâ anticali instructa; margine dorsali concavo; margine ventrali valdè arcuato. Long. $1\frac{1}{8}$; lat. $\frac{1}{2}$; alt. $1\frac{1}{10}$ poll. *Hab.* East Patagonia.

More solid, more concave, and more elongated than any species I am acquainted with. The upper valve of a small specimen from the same locality is semicircular, but more acute anteriorly than posteriorly.

Osteodesma bracteata. Testa parva, tenuis, transversa, inequilateralis, ovato-falcata, ventricosa, margaritacea, epidermide fusco radiatim creberrimè rugoso induta; latere antico rotundato; latere siphonali duplo longiore, triangulari, subadscendente, truncato; margine dorsali recto; margine ventrali arcuato, sub-pendulo: interior deaurata. Long. $\frac{3}{4}$; alt. $\frac{3}{8}$ poll. *Hab.* Puget Sound.

It is with some doubt that I separate this from *O. hyalina;* but if its gilded nacre, its dusky colored, very numerously folded epidermis, and the ventricose, pouched form of the posterior basal portion prove constant, there can be no room for doubt.

Osteodesma Brasiliensis (Couthouy, MS.) Testa fragilis, elongato-ovata, anticè ventricosa et truncata, posticè compressa, concentricè undulata, epidermide flavicante induta; umbonibus ante-medianis, tumidis, approximatis; margine dorsali ferè rectilineari; margine ventrali arcuato: interior margaritacea: ossiculum parvum, oblongum. Long. $1\frac{1}{2}$; alt. $\frac{3}{4}$ poll. *Hab.* Rio Janeiro.

Its elongated, leguminous form, and its large size, plainly characterize it.

Amphidesma croceum. Testa maxima, crassa, calcarea, inequivalvis, subcircularis, posticè hiantula et sub-truncata, liris concentricis reflexis interdum divaricatis arata, radiatim striata; umbonibus sub-medianis, eminentibus, acutis, contiguis: intus crocea; cardo validus, foveâ ligamentali amplâ, profundâ; dentibus rosaceis. Long. $3\frac{1}{2}$; alt. $3\frac{1}{4}$; lat. $1\frac{1}{4}$ poll. *Hab.* Callao?

Very distinct from all other described species, unless it may be *A. solidum*, Gray; from comparison with his description alone, this must be different.

Erycina (Poronia) ovata. T. parva, alba, nitida, concentricè striata, ovato-ventricosa, inequilateralis; margine cardinali arcuata, umbonibus parvis, antemedianis; margine ventrali parum arcuata; latere antico truncato; latere postico rotundato; valvæ dextræ dente cardinali erecto, bifido, foveâ ligamentali parva; v. s. dente integro; intus alba. Long. $\frac{3}{20}$; alt. $\frac{1}{4}$; lat. $\frac{1}{5}$ poll. *Hab.* Sandwich Islands.

Differs from the succeeding species in its smaller size, more inequilateral, ovate-ventricose form, shining surface, and delicate fringe.

A specimen of *Rallus Virginianus*, and *Rallus Carolinensis* were presented by Mr. C. J. Sprague.

Mr. David A. Welles, of the Scientific School, Cambridge, and Dr. William M. Cornell of Boston, were elected members of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING DECEMBER 31.

Journal of the Indian Archipelago and Eastern Asia. Vol. III. Nos. 3, 4, for March and April, 1849. 8vo. Pamph. Singapore. *From the Editors.*

Reports from the Secretary of the Treasury, of Scientific Investigations in relation to Sugar and Hydrometers. By Prof. A. D. Bache and R. S. McCulloch. 8vo. Pamph. Washington. 1848. *From R. C. Winthrop.*

Report of the Committee of the Library in relation to Donations received from the City of Paris, &c. 8vo. Pamph. Boston. 1849. *From the Committee.*

Journal of the Academy of Natural Sciences of Philadelphia. New Series. Vol. I. Part 3. 4to. Philadelphia, 1849. *From the Philadelphia Academy.*

List of Members and Correspondents of the Academy of Natural Sciences of Philadelphia. 4to. Pamph. Philadelphia. 1848. Act of Incorporation and By-Laws of the Academy of Natural Sciences. 12mo. Pamph. Philadelphia. 1849. *From the Philadelphia Academy.*

Annals and Magazine of Natural History for September, 1849. Vol. IV. No. 21. 2nd Series. London. *Courtis Fund.*

Zoölogy of the Voyage of H. M. S. Erebus and Terror. 6 Nos. 4to. London. Fishes. By Sir John Richardson. 1844–8. *From Sir John Richardson.*

Catalogue of the Salem Athenæum. 8vo. Pamph. Salem. 1842. Supplement to the same. 1849. *From H. Wheatland.*

Annals and Magazine of Natural History. No. 22. 2nd Series. Vol. IV. For October, 1849. *Courtis Fund.*

Gray's Genera of Birds. Part 50, completing the work, London, 1849. *Courtis Fund.*

Revision of the North American Tailed Batrachia, with Descriptions of new Genera and Species. By S. F. Baird. 4to. Pamph. Philadelphia, 1849. *From the Author.*

Silliman's American Journal of Science and Arts. Vol. VIII. No. 24. New Series. November, 1849. *From the Editors.*

Description de l'Egypte. Etat moderne et Histoire Naturelle. Planches, 2e Livraison. Folio. Paris, 1812. *From E. R. Mayo.*

Plants of Wisconsin. 8vo. Pamph. By I. A. Lapham. *From the Author.*

Bulletin de la Société Géologique de France. Tome VI. Feuilles 19-26 (19 Febr. - 2d April, 1849) 8vo. 2eme serie. Pamph. Paris. *Société Géologique.*

Catalogue of Skulls of Men and the inferior Animals in the Collection of Samuel G. Morton. 3d Edition. 8vo. Pamph. Philadelphia, 1849. *From S. G. Morton.*

Biographical Notice of George McClellan, M. D. By S. G. Morton, M. D. 8vo. Pamph. Philadelphia, 1849. *From the Author.*

Observations on a new living species of Hippopotamus of Western Africa. By Samuel G. Morton, M. D. 4to. Pamph. Philadelphia, 1849. *From the Author.*

Icones Plantarum. By Sir William Jackson Hooker. 4 Vols. 8vo. London, 1837. *Deposited by Republican Institution.*

British Phanerogamous Botany. By W. Baxter. 2nd Edition. 6 vols. 8vo. Oxford, 1834. *Deposited by Republican Institution.*

De Candolle, Prodromus Systematis Naturalis Regni Vegetabilis. Pars duodecima. 8vo. Parisiis. 1848. *Deposited by Republican Institution.*

Natural History of the Mammalia. By G. B. Waterhouse. 8vo. 2 vols. London, 1846. *Deposited by Republican Institution.*

Traité Elementaire d'Anatomie Comparée. Par C. J. Carus. 2 vols. 8vo. Bruxelles, 1838. *Deposited by Republican Institution.*

Natural History of Man. By J. C. Prichard. 3d Edition. 8vo. London, 1848. Also, 6 Ethnographical Maps, folio. *Deposited by Republican Institution.*

The Races of Man and their Geographical Distribution. By

Charles Pickering. Being vol. 9 of United States Exploring Expedition. 4to. Boston, 1848. *Deposited by Republican Institution.*

Annals and Magazine of Natural History. 2d series. No. 23, for November, 1849. *Courtis Fund.*

Rees's Cyclopædia. 87 vols. 4to. Philadelphia. *Deposited by Republican Institution.*

State Papers of 17th and 18th Congress. 65 vols. 8vo. Washington. *Deposited by Republican Institution.*

Bancroft, George. History of the United States. 8vo. 3 vols. Boston, 1842. *Deposited by Republican Institution.*

Eulogies on Adams and Jefferson. 8vo. Hartford, 1826. *Deposited by Republican Institution.*

Bradford, A. History of the Federal Government. 8vo. Boston, 1840. *Deposited by Republican Institution.*

History of the War of Independence of the United States of America. By C. Botta. Translated by G. A. Otis. 2 vols. 8vo. New Haven, 1838. *Deposited by Republican Institution.*

History of the Navy of the United States of America. By J. F. Cooper. 2 vols. 8vo. London, 1839. *Deposited by Republican Institution.*

Proceedings of Court Martial in Case of A. S. Mackenzie. With Review, by J. F. Cooper. 8vo. New York, 1844. *Deposited by Republican Institution.*

Mallory's Life and Speeches of Henry Clay. 2 vols. 8vo. New York, 1843. *Deposited by Republican Institution.*

Prescott's History of Conquest of Mexico. 3 vols. 8vo. New York, 1843. *Deposited by Republican Institution.*

O'Kelly's History of Ireland. 8vo. New York, 1845. *Deposited by Republican Institution.*

Prescott's History of Ferdinand and Isabella. 3 vols. 8vo. Boston, 1839. *Deposited by Republican Institution.*

Jefferson's Works. 4 vols. 8vo. Boston, 1830. *Deposited by Republican Institution.*

Wirt's Life of Patrick Henry. 8vo. Philadelphia, 1836. *Deposited by Republican Institution.*

Nicholas Nickleby. By C. Dickens. 8vo. Philadelphia, 1839. *Deposited by Republican Institution.*

Life of Arthur Lee, LL.D. By R. H. Lee. 2 vols. 8vo. Boston, 1829. *Deposited by Republican Institution.*

Life of Gouverneur Morris. By Jared Sparks. 3 vols. 8vo. Boston, 1832. *Deposited by Republican Institution.*

Stephens, J. L. Incidents of Travel in Yucatan. 2 vols. 8vo. New York, 1843. *Deposited by Republican Institution.*

Stephens, J. L. Incidents of Travel in Egypt, Arabia Petrea, and the Holy Land. 2 vols. 12mo. New York, 1843. *Deposited by Republican Institution.*

Stephens, J. L. Incidents of Travel in Greece, Turkey, Russia, and Poland. 2 vols. 12mo. New York, 1842. *Deposited by Republican Institution.*

Marshall's Life of Washington. 12mo. 9th Edition. Philadelphia, 1839. *Deposited by Republican Institution.*

Letters on Palestine. By Thomas Wells. Boston. 12mo. 1846. *Deposited by Republican Institution.*

Lyell, Charles. Principles of Geology. 3 vols. 12mo. Boston, 1842. *Deposited by Republican Institution.*

Narrative of the United States Exploring Expedition. By Charles Wilkes. 6 vols. 8vo. Philadelphia, 1845. *Deposited by Republican Institution.*

Riley, James. Narrative of loss of Brig Commerce. 12mo. Hartford, 1844. *Deposited by Republican Institution.*

McIntosh, J. Origin of the North American Indians. 12mo. New York, 1844. *Deposited by Republican Institution.*

Vinton, A. H. Election Sermon. 8vo. Pamph. Boston, 1848. *Deposited by Republican Institution.*

Life of Lafayette. 8vo. Hartford, 1848. *Deposited by Republican Institution.*

Handbuch der Mineralogie von J. F. L. Hausman. 12mo. Gottingen, 1828. *Deposited by Republican Institution.*

Handbuch der Mineralogie von J. F. L. Hausman. 2 vols. 8vo. Gottingen, 1847. *Deposited by Republican Institution.*

Handbuch der Mineralogie von Hartmann. 2 vols. 12mo. Weimar, 1843. *Deposited by Republican Institution.*

Handbuch der Mineralogie von W. Haidinger. 8vo. Wien, 1845. *Deposited by Republican Institution.*

Neues Jahrbuch für Mineralogie, Geognosie, Geologie. Von Leonhard and Bronn. 3 vols. 12mo. Stuttgard, 1845–8. *Deposited by Republican Institution.*

Annalen der Physik und Chemie. Von J. C. Poggendorff. 10 vols. 8vo. Leipzig. *Deposited by Republican Institution.*

Haüy, Traité de Cristallographie. 3 vols. 8vo. Paris. 1822. *Deposited by Republican Institution.*

Haüy, Traité de Mineralogie. 5 vols. Paris, 1822. *Deposited by Republican Institution.*

Haidinger, Uebersicht der Resultate Mineralogischer Forschungen im Jahre, 1843. 8vo. Erlangen, 1845. *Deposited by Republican Institution.*

Zippe, F. X. W. Mineralogie und Geognosie. 8vo. Prag. 1846. *Deposited by Republican Institution.*

January 2, 1850.

Dr. Storer, Vice-President, in the Chair.

Present, thirty-nine members.

Dr. C. T. Jackson exhibited a fossil Calamite from Bridgewater, Mass., one foot in length, and nine inches in circumference at the base. It was fluted, with joints from one inch to one and a half long. He also exhibited specimens of salt from the Great Salt Lake in California, and Carbonate of Soda from the Salæratus Lake of the same region.

Both of these substances are used for culinary purposes by the settlers of that country. The Salt Lake is situated in Lat. 42° 45′ 44″ north, Long. 111° 26′ 34″ west of Greenwich, and is 4,300 feet above the level of the Pacific Ocean. The Salæratus Lake is near Independence Rock, in Lat. 42° 30′ 16″ north. The soda appears like ice, filling a depression in the plain, of two acres in extent, and about two feet thick, with no water beneath it. On exposure to dry air the Sal soda loses part of its water and acquires more carbonic acid so as to be converted into the sesqui-carbonate, as seen in the samples exhibited. It is observed that cows and oxen grazing near these Lakes sicken and die, but horses do not suffer. The soil around them is poor and sandy. The principal plants are Artemisia and "grease bushes." Dr. Jackson also gave an analysis of a bottle of water from a Hot Spring which issues from a Sandstone hill two or three thousand feet high in the same region, with a temperature 108° F. One pint contained 44 grains of solid matter, as follows: —

Carbonate of Lime,	1.280
Peroxide of Iron and a trace of Oxide of Manganese,	0.208
Lime,	2.907
Chlorine,	18.421
Soda,	15.344
Magnesia,	2.073
Sulphuric Acid,	3.748
	43.981
Loss,	.019
	44.000

This water is a very agreeable saline spring, containing, when fresh, a little sulphuric and carbonic acid gas. The above specimens and statements concerning them were sent to Dr. Jackson by Dr. Bernhisel of the Mormon settlements.

Dr. Jackson likewise communicated the fact that the plumbaginous mica slates of Vermont contain a considerable portion of tin diffused through their mass in a state of combination not yet determined. The specimens received were from two localities, and yielded a considerable quantity of an alloy of tin and iron when fused in a crucible lined with lampblack. Specimens of the rock were exhibited, with globules of the metal extracted from it. This discovery is an important one, as it points to the probable occurrence of tin ores in districts where they were never suspected to exist. For if an extensive rock formation is filled with tin in some state of combination, veins of the oxide or sulphuret cannot fail to exist somewhere in its mass. Pieces of plumbaginous slate so full of graphite as to prove valuable as plumbago have been recently assayed by Mr. Richard Crossley in Dr. Jackson's laboratory, and malleable grains of an alloy of tin and iron have been obtained.

Prof. Agassiz said that he had recently received from Capt. Atwood of Provincetown, a specimen of the common Porpoise of our waters.

It had hitherto been considered as identical with the *Phocæna communis* of Europe, but his examination had led him to regard it as a distinct and hitherto undescribed species. In *P. communis* the temporal groove of the skull is narrow and oblong; in the American species it is as wide as long. The general form of the skull is also different. In the European species the posterior surface is nearly vertical, in the American it is much curved. The teeth of the American species, although agreeing in general with those of the European in form, are grooved on the broad faces near the summit so as nearly to divide them into three lobes; in the European they are smooth. The dorsal fin is serrated and furnished with very characteristic tubercles in the American species, which are not mentioned in the descriptions of *P. communis.* Prof. Agassiz exhibited drawings of the external appearance and of the muscular structure employed in the movements of the tail. He proposed for the new species the name *P. Americana.*

Prof. Agassiz said, that at a former meeting he had spoken of the connection of the gills of Crustacea with the legs, and he now proposed to give the result of his examination of the solid framework of those animals with reference to these organs.

Milne Edwards, he remarked, only notices those parts which are external to the shield, thus omitting structures of great importance. On cutting across the shell of a Lobster, it is found that the membrane lining it is reflected at the lower margin, and forms a sac containing the gills, not communicating with the proper cavity of the shell, but opening outwards for the admission of water. Prof. Agassiz was at once struck with the analogy which this fact presented, and for which he had long been seeking, between the gills of Crustacea and the tracheæ of insects. Suppose the sac of Crustacea to be divided transversely, making a separate cavity for each gill, and the arrangement would be similar to that in insects, in which each trachea is situated in a fold of membrane between the rings. The respiratory system is constructed after the same type in both. Prof. Agassiz next proceeded to give a detailed description of the solid framework of the Lobster. He showed that the terminal plate of the tail, which is furnished with broad flat fins, is not a locomotive appendage merely, but properly a ring of the body. The anterior pair of these caudal locomotive organs, speaking morphologically, is the penis, which shows some indications of divisions, like the joints of the legs. In most Crustacea the second pair of claws is enlarged so as to furnish instruments of defence. In the Lobsters, the claws thus enlarged have been hitherto considered the first pair of thoracic limbs; but on careful examination, Prof. Agassiz found in advance of the second a very small pair, which had hitherto been overlooked; he therefore considers the last pair of jaw-legs, as thoracic limbs properly belonging to the organs of locomotion. In conclusion, Prof. Agassiz remarked that his analysis of the component parts of each division of the Lobster showed that the number three with its multiples is the fundamental number upon which it is made up, and that this obtains for the chest as well as the other regions of the body. The name of *Decapods* is therefore inappropriate for any group of Crustacea.

Mr. Whitney said that in the Bruce Slate Quarry at Guilford, Vt., the vertical strata are at one point broken abruptly, over an area of only one hundred square feet. Prof. Hitchcock had suggested that the fracture might have been caused by the sudden impulse of a large mass of floating ice. During the past summer he had seen a similar fracture at Lake Superior, at the Jackson Forge. Here the slate strata are nearly vertical, bearing nearly north and south. Over a small portion of the top of the hill there is a fracture precisely like that at Guilford. The strata have been carried forward as well as bent and crushed, as if they had been swept along by the crushing force. The displaced portion is imbedded in stratified drift, which is lodged in the depression beyond the ledge. These appearances are strongly corroborative of Prof. Hitchcock's theory, that such fractures are caused by the crushing action of icebergs.

Prof. Hitchcock remarked that the suggestion was not original with him, but he had borrowed it from Darwin, who attributed similar fractures in the slate rocks of Great Britain to the action of enormous icebergs floated up and down by the movements of the ocean, and thus lodged on these rocks.

Prof. Hitchcock exhibited to the Society a tarso-metatarsal bone and some of the phalanges of *Palapteryx ingens*. The specimen had been brought from New Zealand by a sailor, from whom he had obtained it. He had replaced the missing bones by artificial ones. The lower extremity of the tarso-metatarsal bone showed four articulating surfaces for the toes, all directed forwards. The length of this bone was fifteen inches, and the probable height of the species, according to Owen, was nine feet.

Dr. A. A. Hayes mentioned some experiments he had tried on a small scale to arrest the progress of decay in potatoes after they had been taken from the earth. He had found that the gas of sulphurous acid passed over them checked the process of decomposition immediately.

Mr. Teschemacher said that he believed the rot in potatoes to be caused by the development of an organic substance similar to that generated in the process of fermentation, and it was well known that this process was immediately arrested by sulphurous acid gas.

Mr. J. L. Hayes stated that Dr. Webster of Nova Scotia, had lately procured some specimens of recent bird-tracks in the sand of the Bay of Fundy, which were precisely like the fossil bird-tracks of the Sandstone of the Connecticut valley.

The enormous tides of this Bay wear away the Sandstone and deposit it on the neighboring beaches to the depth of from half an inch to an inch, at each tide. Dr. Webster carefully removed some of this sand bearing the foot prints of marsh birds, and baked it so as to preserve the impressions perfectly. It was even found that in splitting these slabs into layers the impression of the track could be traced through three or four of them, as in the fossil specimens. The same success attended his experiments on the impressions of recent rain drops. The experiments were made during the past year.

Dr. Gould mentioned, that four years since, similar specimens were sent him by Rev. Mr. Prior of Horton, baked by the heat of the summer sun, during the recess of the tide ; and Mr. Lyell also obtained specimens, which were so satisfactory as to convince English geologists that the fossil bird tracks were what they had been considered to be by American geologists.

Dr. C. T. Jackson said that he wished to correct the record of November 1, 1848. The statement there attributed to him as to the age of the Lake Superior Sandstone should be accredited to his assistants, Messrs. Foster and Hill, as he stated at the time.

Prof. Wyman made some remarks on the probable cause of the jet from the blow-holes of whales.

During the past summer he had had an opportunity of observing this phenomenon while on a visit to Labrador. Three causes for this jet had been assigned, namely, the water taken into the mouth with the food of the animal, the water in the nasal cavities, and the secretions of the bronchial tubes. As it appears in the form of a sudden discharge of vapor, he thought a fourth explanation might be added, the sudden rarefaction of the air when inhaled, followed by its sudden condensation when emitted. He thought it was partly due also to the small quantity of water which entered the outer extremity of the nasal passages. He had succeeded in imitating the appearance in question, by introducing a small quantity of water into the end of a syringe and suddenly expelling it with the body of air behind it, with considerable force.

Dr. Pickering said that he could not think the condensation of the air when expelled from the lungs of the whale was a circumstance of much importance in forming the jet, as in tropical climates, where this could hardly occur, the jet was as complete as in colder latitudes.

Prof. Wyman said, that at Bras d'Or he had heard the inspiration as well as the expiration of Cetaceans. It follows the expiration instantaneously but is much shorter and less audible.

Mr. Ayres, from his own observations, confirmed Prof. Wyman's views. He said he had noticed in a young porpoise that the act of breathing is much more slowly performed than in the adult.

Mr. J. L. Hayes made some interesting statements relative to the smelting of iron. He said, that in Corsica an American gentleman had made eighteen tons of iron daily for a week, using cold blast; a quantity very much greater than that usually obtained in the same time by hot blast, which had heretofore been considered the best. Even larger quantities had been made in New Jersey by the same process in furnaces with very wide mouths.

Mr. Teschemacher referred to a statement of his at a former meeting, that he had detected Vanadium in specimens of minerals from Isle Royale.

At a subsequent meeting he had retracted this statement on the authority of Mr. Schleeper, who had failed to discover it in the specimens submitted to him for examination. It now appeared that his first statement was correct. It is found in large quantities at Isle Royale, Lake Superior, in cavities of the vein-stone. Mr. Schleeper's failure to detect it arose from the very small quantity Mr. Teschemacher was able to submit to him for examination.

Mr. Teschemacher's statement was corroborated by Dr. A. A. Hayes.

Mr. Alger stated that an extensive deposit of Barytes had been recently found in Nova Scotia. It was distinctly foliated, and the discovery was an important one, from the great use made of this substance in the arts. He presented to the Society specimens of it, together with Sulphate and Silicate of Copper from South America, and micaceous Specular Iron ore from Nova Scotia.

The Curator of Ornithology announced the addition to the Collection of a specimen of *Somateria spectabilis*, King Duck, female, purchased; and *Pipra manachus*, presented by Dr. F. W. Cragin.

Dr. Brewer presented the head of an Egyptian Ibis mummy, and a Crocodile's Egg.

Dr. G. H. Lodge and Mr. G. F. Williams were elected members of the Society.

January 16, 1850.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, forty-two members.

Dr. Storer said that it was his melancholy duty, as presiding officer of the meeting, to announce to the Society the recent decease of Dr. Martin Gay, one of its oldest and most valued members. He hoped that some gentleman present would take it upon himself to express those sentiments of esteem for our late associate, and regret for his loss, which must be in the hearts of all.

Mr. Bouvé responded to this call, as follows: —

Mr. President: — I cannot, nor would I, refrain from giving utterance to the feelings that move me upon the sad event which has just been announced from the chair. I might well hesitate to rise, in view of the many present, older and wiser than myself, who would doubtless be glad to show their appreciation of the worth of the departed, by their well merited praises of him; but, sir, feeling that I knew him better than most who shared his friendship, I am led to think I owe it to his memory to say at least a few words concerning him. With Dr. Gay I was indeed most intimate, and I express, therefore, what I know, when I claim for him a degree of virtue, a nobleness of purpose, an exaltation of character, far beyond what is generally found in man. Conscientious to a great degree, every deed performed by him, every judgment given, first received the sanction of the highest sentiments of his soul; and, long as I have known him, I never heard him even express an impure thought. Loving God, and loving man, his desire was, to enlarge his own being that he might the better serve both. Too great by nature and culture to confine his regard to those of a class, or a sect, all who sought his friendship, and were worthy, found in him ready sympathy. The bickerings and the jealousies that trouble smaller men never reached him; but yet he was ever ready to advocate manfully the cause that appeared to him just. Without guile, transparent to all whose motives were kindred to his own, he inspired and enjoyed the confidence of the community. His attainments were of a high order. Love of the beautiful in nature and art, and in spirit, was a ruling trait in his character. A fine scene, a good painting, or a noble action, would alike kindle his enthusiastic admiration. In truth, we have lost from amongst us a presence which sanctified communion by its purity; a wisdom which was more than that of this world; and a loving soul which we trust has found acceptance in the land of the pure and the holy. God help us, that we may be as ready as was our brother to bid adieu to present scenes of action, when we are summoned hence to be here no more forever.

In conclusion, I offer the following resolution:—

Resolved, That we recognize in the sudden death of Dr. Martin Gay, the loss to the Society of a member of high scientific attainments; to the profession, of which he was an ornament, a devoted and faithful laborer; to the community, an upright, conscientious, pure-minded, and noble-hearted man; and to his near friends and kindred, a gentle, and loving spirit, that was ever ready to sympathize with them in joy or in sorrow, and that blessed all who came within the sphere of its influence.

Before any action was taken on the resolution, Dr. C. T. Jackson entered the meeting. He stated that it had been his intention to announce to the Society the decease of Dr. Gay, but he had been prevented from being present in time. He proceeded to read an obituary notice, giving a sketch of his life, and bestowing a high eulogium upon his moral and intellectual character.

At the conclusion of the above notice Mr. Teschemacher seconded Mr. Bouvé's Resolution, which was adopted unanimously.

On motion of Mr. Teschemacher, it was

Resolved, That we deeply sympathize with the widow and surviving relatives of our late associate, Dr. Gay, in their present great affliction; and that the Secretary be directed to communicate to them an attested copy of this Resolution.

On motion of Dr. Durkee, seconded by Mr. J. H. Abbot, it was

Voted, That a copy of the remarks of Mr. Bouvé and Dr. Jackson be communicated with the resolution of condolence to the widow of Dr. Gay.

Prof. Agassiz stated, that in his recent study of the Medusæ he had been able to make out a distinct muscular structure.

It consists of three systems of fibres, one superficial, which had been never before observed, just under the epidermis, the others more deeply seated. The external layer is made up of circular and vertical bands of fibres, surrounding the whole mass like the net of a balloon, and capable by their contraction of changing its shape and reducing its size. The vertical bundles alternating with the radiating tubes are by far the strongest. The fibres upon the inner surface of the disk are disposed in two layers, one of circular, and the other of vertical fibres. The former lines the cavity, and the latter is situated between the circulating tubes. By the contraction of these last, the eye-specks can be moved. In the transverse partition of the animal a circular and radiating set of muscular fibres can be made out, the latter assisting in moving the eye-specks. Prof. Agassiz mentioned, that he had also completed the study of the *nervous* system in Medusæ. He had found a continuous nervous thread extending from one eye-speck to another. These organs present a closer analogy to the organs of vision in the higher animals than had been generally supposed. In their structure some of them united in clusters closely resemble a vertical section of the compound eyes of insects, and probably are capable of receiving an impression of light and darkness if not of distinct images. Prof. Agassiz stated that his observations of the muscular system of Medusæ were made on them when in the state of contraction immediately after death. During life the movements are too active to permit close examination. He exhibited part of a series of engravings illustrating their structure.

Dr. C. T. Jackson read analyses of three samples of White Cast Iron, containing manganese.

The Iron was remarkably crystalline and brittle, and resembled in color, pure antimony. Specimen No. 1. was crystallized in broad lamellæ, and cleaved readily into crystalline forms when broken.

Sp. Gr. was 7.684. This specimen was from Cooper's furnace, in Eastern Pennsylvania.

On analysis of 0.5 gramme of the metal the following results were obtained, per cent.

Iron, ...	91.10
Manganese, ...	5.76
Carbon, ...	1.74
Silica, ...	1.40
	100.00

Specimen No. 2. was obtained from the furnace in Plymouth, Vt., and was reduced from a brown Hæmatite mixed with black oxide of Manganese. The metal is highly crystalline, with broad plates of crystals intersecting each other, giving the broken surface of the pig the appearance of Meteoric Iron that had been acted upon by acids.

The specific gravity of this iron is 7.488.

Selected crystals were analyzed, and the following results were obtained.

Iron, ...	83.2
Manganese, ...	9.6
Carbon and Silica, ...	10.0
	102.8

The following results were obtained by Mr. Richard Crossley, on analysis of the one from which this iron is made.

Insoluble silica and silicate of Alumina,	9.58
Peroxide of Iron, ...	53.66
Oxide of Manganese, . . .	31.17
Alumina with traces of Cobalt and water,	5.59
	100.00

53.66 of Peroxide of Iron contain 37.2 of Metallic Iron. The ore does not contain any sulphur, phosphorus, or arsenic.

Specimen No. 3. was obtained from the furnace in Woodstock, N. B., and was reduced from a Manganesian red Hæmatite. The metal is hard, white, and granular-crystalline, with a few intersecting plates of crystals.

Its specific gravity is 7.330.

On analysis the following results were obtained.

Iron,	82.22
Manganese,	16.26
Carbon,	0.36
Silica,	1.40
	101.24

Analysis of the ore from which this iron was reduced.

The following results were obtained by Mr. Richard Crossley, who analyzed the Hæmatite from Woodstock last year.

Silica,	17.80
Carb. Lime,	4.00
Alumina,	2.10
Perox. Iron,	52.50
Oxide of Manganese,	18.90
Water,	5.70
	101.00

52.50 of per Oxide of Iron contains 36.39 of metallic Iron. 18.90 Manganeso-manganic oxide contains 13.62 of Manganese. Hence, $36.39 + 13.62 = 50.01$, and

$$50.01 : 13.62 :: 100 : 27.23 \text{ Manganese.}$$

It appears, therefore, from my analysis, that more than half the oxide of Manganese in the ore was reduced and entered into an alloy with the Iron.

These alloys are not generally understood by Iron masters, founders, and refiners, and are frequently mistaken for iron containing sulphur or phosphorus.

Manganesian Iron is unfit for foundery purposes, but makes the best kinds of malleable or wrought iron when refined in the forge or puddling furnace. It "comes to nature" slowly, and hence makes a good mixture with iron rich in carbon, which "comes to nature too quickly," and is liable, therefore, to be badly refined, breaking while hot under the tilt hammer, or "brooming up" in the process of hammering.

It is obvious that there is a loss in weight of iron in purchasing the highly manganesian irons, but in those containing but little manganese it is of no account, since it merely displaces a certain proportion of carbon. It appears from the relative specific gravities of the samples which I have analyzed, that a highly manganesian iron may be readily known, its specific gravity being less than that of ordinary white carboniferous iron. By a more extensive series of researches much may be learned in relation to the alloys of iron, and the importance of the business in a practical view requires that such examinations should be made.

Mr. Desor gave an account of the clay and drift deposits in the vicinity of Lake Superior, and explained their connection with similar deposits farther west.

Along the rivers running into the Lake is a layer of red clay from forty to sixty feet thick, considered by some geologists as tertiary, covered by a wide-spread drift deposit, which he considders as corresponding to the blue clay of Michigan. The blue color being due to the decomposition of shells found in that locality. On Mackinaw Island, at the height of two hundred feet, is a deposit of red loam one hundred feet thick, also evidently corresponding to the red clay at the east end of Lake Superior. The "yellow, hard pan," of the western geologists, Mr. Desor considers a local form of the blue clay.

The wide spread drift deposit of the West is particularly conspicuous in the rolling prairies. Boulders are sometimes found on its surface, generally from ledges far to the north, some of them having been brought six hundred miles. As they are as large at their southernmost limit as at the north, the transporting power can have lost none of its intensity. The drift is the thickest near the Pictured Rocks, where it is three hundred and forty-five feet thick. At Cape Girardeau, above the junction of the Ohio and Mississippi Rivers, it is the thinnest. It extends with scarcely an interruption from the Mississippi and the Lakes to the Atlantic. From Zanesville, Ohio, to the Alleghanies, it is wanting. On the eastern slope of the first branch of these mountains it reappears, and as far as their eastern border is made up of materials from this source.

Mr. Desor spoke of a deposit considered by geologists as a Lake drift, particularly noticeable at Lake Erie. He had considered it important if possible to establish its lacustrine origin from fossils contained in it. On Lake Michigan it appears as a bluff twelve feet thick, made up of nine feet of sand over blue clay. He succeeded in finding in this deposit eight species of fossil shells, several of them identical with those now living in the adjoining Lake, such as *Cyclas*, *Paludina*, *Melania*, and *Unio*. In the underlying stratum were reeds, one of which was from an inch to an inch and a half in diameter, extending up into the sand, equiseta, and a piece of cedar, the locality having probably been occupied by a cedar swamp. There are no trees of this species at the present time within many miles of the spot. The nature of this deposit leads to the supposition of a depression and subsequent elevation of the country. To the south and east of Lake Michigan is a belt of this flat prairie of fresh water origin. The rolling prairies of the West on the contrary are of marine origin and probably antedate the flat. A few boulders are found on the surface of the flat prairie, the presence of which might seem to be incompatible with this theory; but they may have been deposited by ice, either in the form of bergs or ground ice. The main drift deposit over the northern parts of the United States, Mr. Desor attributed to the ocean.

Mr. Edward Cabot mentioned, in connection with Mr. Desor's observations, having found on the bank of the Illinois River a red cedar trunk rounded and worn, twenty-five feet long; there being no living specimens of this tree in that part of the country.

Prof. Agassiz said that he had shown, at a former meeting, that in studying the relations of different stages in the embryonic development to permanent forms of insects, a better idea of their natural classification could be obtained than in any other way, and he now proposed to continue his observations, and to show that this view might be still further carried out, even to the fixing of the relative positions of the different families.

It had been a question whether the Diurnal or the Nocturnal Butterflies should stand first in the scale. He proceeded to show that the different positions and relations of the wing in the progress of development of Papilio correspond to the permanent conditions of these appendages in the various families of Lepidoptera, and thence deduced their true position; placing, 1st, Papilionidæ; 2d, Hesperidæ; 3d, Sphingidæ; 4th, Bombycidæ; 5th, Noctuidæ; 6th, Pyralidæ; 7th, Tineidæ. In a similar way Prof. Agassiz indicated the true position of the different types of Articulata, showing a close analogy between their permanent forms and the transient conditions of an insect, beginning with the caterpillar, which corresponds in type with the Annelida. By the same test he showed the true position of Millipedes and Spiders; the former being insects with a worm-like form, the latter with the anterior parts united into a cephalothorax like the Crustacea, corresponding to the pupa condition in type.

Dr. Kneeland read a paper entitled, "The Manatus not a Cetacean but a Pachyderm." It contained an elaborate and careful analysis and comparison of the skeleton of the Manatus recently presented to the Society with the skeletons of Cetacea and Pachyderms, showing a much closer analogy with the latter than the former.

Prof. Agassiz referred to the breathing organs of Mollusks, and remarked that they do not properly correspond to the gills in Crustacea. Thus in the Mollusk they are folds of the body on the inner surface of the mantle, while in the Articulata they are appendages to the legs; so that the plan on which the pulmonary apparatus of mollusks is constructed is quite different from that exhibited in other animals. He illustrated his views by descriptions of the various families of this class, showing that the so-called lungs of pulmonated mollusks are in their character analogous to the respiratory organs of other mollusks, the difference being merely morphological.

The skeleton of a Javan Squirrel, *Sciurus bicolor,* was presented in the name of R. B. Forbes, Jr. The thanks of the Society were voted for the donation.

Skeletons of a Horse, Woodpecker, and Grey Squirrel were likewise presented.

Mr. George W. Collamore, of Boston, was elected a member of the Society.

February 6, 1850.

The President in the Chair.

Present, twenty-eight members.

Dr. Kneeland read a paper on the skeleton and stuffed skin of a weasel, recently presented to the Society by Dr. Cabot.

The specimen is from South America, and belongs to the species named by Linnæus *Mustela barbata.* Dr. Kneeland was of opinion that it should be transferred from the genus Mustela, with which it agrees in many respects, to the allied genus Putorius with which it coincides in the dental formula; the cheek teeth being $\frac{4-4}{5-5}$, and the whole number of teeth being 34. The skeleton can hardly be distinguished from that of the Common Mink, *P. vison,* except that it is twice as large. It seems to occupy an intermediate position between the Plantigrades and Digitigrades, having the motion of the one and the teeth of the other. It should be named *Putorius barbatus.*

The *color*, from the base of neck backwards, above and below, with the tail, was *black;* the head and neck *light grayish brown*, or hoary white; *under the throat* a narrow *yellowish white spot*, about two inches long; end of nose black; around eyes, jaws, and top of nose reddish brown.

Length of head and body, . .	23	inches	Total 3 feet, 2 in.
“ “ tail to end of fur, . .	15	“	
“ “ head, ...	4	“	
“ “ neck, ...	5	“	
“ “ body, ...	14	“	

Height at shoulders,	$7\frac{1}{2}$	inches.
" " posterior extremity,	8	"
Length of skull,	4	"
Height of skull at meatus,	$1\frac{5}{8}$	"
Greatest diameter behind meatus,	$1\frac{7}{8}$	"
Diameter at zygomatic arches,	$2\frac{1}{8}$	"
Diameter of skull at middle of do.	1	"

The canine teeth project $\frac{5}{8}$ of an inch beyond alveolus; the lower incisors are arranged, 4 in front, and 2 others behind the middle front ones.

Mr. Girard read a note upon some researches of his own with reference to the so called "biogen liquid" recently described by Mr. Desor as existing in the ovum of Ascidia, as follows: —

When not long since the notion of the existence of a Biogen liquid presiding over the formation of the eggs in the animal kingdom was first introduced in the science of Embryology, I availed myself of every opportunity offered to me to repeat Mr. Desor's observations. I thought that if this liquid was a phenomenon as general as the author seemed to believe, the eggs of any given animal would be fit for these researches. I spent much time without arriving at any satisfactory result. I became convinced of this first fact, namely, that the Biogen liquid, should it prove to be something, must be peculiar to some particular animal and not referable to the whole animal kingdom.

I determined to seek for it in the very species where it was said to be found. I sought it there in vain during several weeks, and was at a loss to know whence the Biogen could have been derived, when I happened to make an observation which fully explains the matter. Having out a fragment of an ovary, I placed it between two glasses, which I pressed strongly together, and when I thought the eggs sufficiently crushed I examined *this preparation* under the microscope. To my greatest astonishment (I cannot say satisfaction), I had before my eyes the phenomena of the condensation of the yolk as they are illustrated in Silliman's Journal.*

My conclusion is, that the theory of Biogen is without foundation, the fundamental fact upon which it was built up being an accidental one.

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* No. 21, May, 1849, p. 396.

Besides this, another circumstance had struck me, namely, that the ovarian eggs of an Annelid were illustrated by Mr. Desor, almost side by side with those of Ascidia, without any reference being made to Biogen. This is explained by the fact, that the eggs of Annelids can be observed easily without any compression to isolate them.

As for the comparison the author has established between the formation of the eggs in general and that of heavenly bodies, according to the nebula hypothesis, it is easy to see that it no longer requires controverting.

Thus, the great law of universal attraction is by no means at the bottom of organized bodies; and with regard to the movements of the larva of some few invertebrated animals, there is nothing in them which resembles the phenomenon of the motion of the celestial bodies. (See p. 85.)

Dr. Burnett read a paper upon the external parasites of warm-blooded animals. From his study of these insects, he said he had established to his satisfaction the following facts:

1st. That although there are single species peculiar to particular animals, there are others which are found in different species of the same genus, as is the case in the parasites living on birds of the genus Larus (Gulls) and the diurnal birds of prey.

2nd. The parasites of the human body confine themselves strictly to particular regions; when they are found elsewhere it is the result of accident. Thus, the *Pediculus capitis* lives on the head; the *P. vestimenti* upon the surface of the body; the *P. tabescentium* on the bodies of those dying with marasmus; and the *Phthirius inguinalis* about the groins, armpits, mouth, and eyes, or the homologous parts of the body.

From an examination of the structure of these animals, Dr. Burnett was of opinion that they should be placed in an order by themselves, closely allied to the Insecta; they number about 250 species, the Mandibulate parasites occupying the highest, and the Haustellate the lowest position in the order.

Mr. Alger read a paper on the comparative value of various kinds of American Sandstone as building material. He exhibited specimens of the New Brunswick, New Jersey, and Connecticut Sandstones, and gave a detailed chemical and mineralogical description of each. From a comparison of their various qualities he concluded that the first two are of about equal value for building purposes, and both of them superior to the third. He spoke of Dr. Ure's test of the durability of Sandstone by immersing it in a saturated solution of sulphate of soda, the crystallization of which it was thought would imitate the action of the freezing of water in its pores. He had understood that in Great Britain it was much relied on in selecting building stone, but he thought it doubtful whether it would be of much value in this country, from the greater severity of the climate.

Prof. Rogers said he distrusted the value of the test, as the process of crystallization was not strictly analogous to freezing. In the formation of ice there is no loss of water, like that which occurs in the process of crystallization. A specimen of Sandstone, which had stood Dr. Ure's test, having been used for the construction of a public building in Philadelphia, was found to exfoliate after two years' exposure to the action of the elements.

Dr. C. T. Jackson confirmed Mr. Alger's and Prof. Rogers's statements as to the value of Dr. Ure's test. He thought the surest way of ascertaining the power of a Sandstone to resist the action of water and temperature, was to examine the rock in the quarry, where it was always easy to obtain, on the exposed surfaces, the most satisfactory evidence.

Prof. Wyman exhibited some fossil bones of Seals found in the Miocene deposit beneath the city of Richmond, Va., where they occur in company with the teeth of Sharks and Zeuglodonts. The only other locality in the United States where similar remains have been found is at South Berwick, Me., as mentioned by Dr. C. T. Jackson; they were found in digging a well, and were recognized by Prof. W. as parts of a radius and ulna.

Prof. Wyman said that he had come to the conclusion some time since, that the Walrus should not be classified with the Seals. Their dentition is quite different. That of the Seals is the dentition of Carnivora, while the Walrus, besides its tusks, is furnished with grinders having simple, blunt crowns. Its stomach is elongated, and its food, so far as it is known, is vegetable, consisting of the fuci of the shores on which it lives. These facts, together with the thickness of the skin and the form of the head, bring it much nearer to the Pacyhderms than any other animals. It seems to hold the position with reference to the Pachyderms that Seals do with relation to the the true Carnivora.

Mr. Desor asked if Prof. Rogers had any theory to explain the interruption of the drift mentioned by him at the preceding meeting as occurring west of the Alleghanies.

Prof. Rogers replied, that he supposed the drift in coming from the north had been turned aside by opposing obstacles, as is indicated by a change in the direction of the drift scratches, and by the greater thickness of the deposit where natural channels had been offered for it. In this way openings would be left between diverging currents.

Mr. Desor mentioned that on Lakes Superior and Michigan the striæ run from N. E. to S. W. One set runs due N. and S. and is perhaps of more recent origin.

Mr. Desor made some remarks on the relation of the alluvium to the drift of the Mississippi.

Mr. Lyell, he said, after a careful examination of the banks of the Mississippi and Ohio, queried whether the bluffs were of the same formation from Natchez to the Falls of St. Anthony. Mr. Desor was of opinion that the Natchez bluff was analogous to, and the continuation of, the low terraces or flat prairies at Cairo, and on the eastern side of the Mississippi above St. Louis. His opinion was based upon the fossil bones discovered in both localities. The Natchez bluff he thought had been correctly explained by Mr. Lyell, who supposed that at the time of its deposition the whole basin was low, subsided gradually and was afterwards raised. If this had not been the case, marine fossils would probably have been found, from its proximity to the sea. This bluff is two hundred feet high and contains land and fresh water shells and mastodon bones.

Mr. Desor remarked, that it was interesting to observe the influence which geological causes had had in fixing the localities of cities on the Mississippi and Ohio. The terraces of the upper Mississippi are very low and exposed to inundations, so that towns can only be built on the bluff beyond. This limits the location of towns to those bluffs near the river. On the Ohio, on the other hand, the terraces have been elevated to the height of fifty, eighty, or one hundred feet, and the cities are built upon this alluvial foundation, having the drift behind them; in the Mississippi they are built on the drift itself, so that the banks of the Ohio offer the more eligible situations for settlement.

Dr. Storer addressed the Society on behalf of the Journal. He urged upon the members its value and importance as a means of extending the influence of the Society and promoting the interests of Science. He hoped that members would give evidence of their continued interest in the Society by making an effort to increase the subscription list, now that the sixth volume was just commencing.

Robert Briggs, Jr. was elected a member of the Society.

February 20, 1850.

The President in the Chair.

Present, twenty-nine members.

Dr. C. T. Jackson read an analysis and description, and exhibited a specimen of Vermiculite from Millbury, Mass. The analysis was made by Mr. Richard Crossley. Dr. Jackson exhibited to the Society the singular property which this mineral has when heated, of swelling to many times its original size, and shooting out long cylinders or prisms of a worm-like appearance.

The following is a description of the mineral operated upon. This mineral occurs in small thin scales, having an olive green color when seen by reflected light and an apple green color by transmitted light. These scales are imbedded in a soft magnesian rock resembling decomposed talcose rock, but which probably consists of the decomposed particles of Vermiculite mixed with various earthy and ferruginous matters.

The scales of Vermiculite are rarely more than a sixth of an inch in diameter, and although they are apparently irregular prisms, are not well defined on the lateral planes. They split easily into very thin laminæ like talc, and are flexible and not elastic. They have an unctuous feel when rubbed between the fingers, but this character is not so marked as in talc.

Their lustre is pearly and somewhat greasy. Color, as before stated, olive green by reflected light, and apple green by transmitted light. Thin scales are translucent and sub-transparent. Hardness a little above 1. of the scale of Mohs. Specific gravity of the dried mineral, according to Crossley, 2.756.

A scale of the mineral, heated before the blowpipe, instantly swells and shoots out into a long cylinder or prism curling like a worm. The sides of this vermiform mass are marked by transverse divisions from separation of the laminæ of the mineral, and the scale is found to have increased to from fifty to nearly one hundred times its original thickness. On raising the temperature to redness the mineral glows strongly and is found, after cooling, to have changed its aspect, having now a perfectly silver white color with a strong pearly lustre. A scale held in the forceps is readily melted before the blowpipe into a bottle green glass. With Carbonate of Soda it melts into an opaque brownish green bead.

With Borax it dissolves into a clear yellow glass which becomes colorless on cooling. In the reducing flame the color assumes a greenish tint. With salt of Phosphorus it dissolves readily, imparting a yellow color to the bead while hot, and becomes colorless on cooling. The bead becomes white and slightly opaque from separation of the silica. Heated in a glass tube the mineral quickly exfoliates into long prisms, giving out water, which condenses in the upper part of the tube. A higher temperature causes the mineral to give out more water, and this water was observed to restore the blue color to reddened litmus paper, showing that it was slightly alkaline, probably from absorbed carbonate of ammonia. By heating the mineral on paper cards and on plates of lead the temperature at which exfoliation takes place was ascertained to be between 500° and 600° F. By the researches of Mr. Crossley it was ascertained that this mineral could be entirely decomposed by the action of a mixture of sulphuric and chlorohydric acids; hence it was unnecessary to attack it by fusion with fixed alkalies. The results of his analysis are as follows: —

		Oxygen.		Ratio.
Silica	35.74	18.56		6
Alumina	16.42	7.66		2
Protoxide of Iron	10.02	2.28	12.90	4
Magnesia	27.44	10.62		
Water	10.30	9.15		3
	99.92			

Hence the approximative formula will be

$$2\ \mathrm{Al\ Si} + 4\ \mathrm{Mg\ Si} + 3\ \mathrm{Aq},$$

which is the formula of Pyrosklerite, according to Kobell. Dufrenoy, Traité de Minéralogie, T. iii. p. 503. While writing this I have received a letter from Mr. J. D. Dana, who suggests that the formula

$$2\ \mathrm{Mg}^3\ (\dddot{\mathrm{Si}}\ \mathrm{Al})^2 + 9\ \dot{\mathrm{H}}$$

will answer to Mr. Crossley's analysis.

The name Vermiculite having been given to this mineral in 1824 will take precedence over that of Pyrosklerite if the two minerals should be regarded as identical.

Mr. Teschemacher read a paper on the mineral which had just been exhibited by Dr. Jackson. He referred to an opinion expressed to the Society some years since, that Vermiculite and Pyrophyllite of Hermann are identical. He proceeded to compare Mr. Crossley's analysis of Vermiculite with Chonikrite, Pyrosklerite, Kammererite, Rhodocrome, and Pyrophyllite of Hermann, Rammelsberg, and Thompson, coming to the conclusion that the last most closely resembles the mineral in question; it being the only one of them, which, besides other similar characters, as hardness, color, &c. possesses the singular property exhibited by Dr. Jackson, under the influence of heat. Rammelsberg considers the mineral from Beresof and that from Spa the same, from their ingredients being the same although differing in quantity, and from their pyrognostic character. In accordance with Dr. Jackson's remark, that the water from Vermiculite restores the blue color of litmus paper, Mr. Teschemacher suggested that the appearances produced by heat must be due to the escape of Ammonia. Hence, Mr. Dana's opinion seems probably correct, that these minerals are in a state of decomposition, and in this condition have absorbed this alkali, so that any name given to it should properly have reference to this character.

Dr. C. T. Jackson said he was willing to admit the fact of the close resemblance of the two minerals to each other, but he must still regard them as distinct from the differences of their chemical formulæ.

Mr. Teschemacher alluded to a specimen of bark from a South American tree recently exhibited by Dr. Hayes before another Society, which is used for purposes of washing. It is from the *Chelaia Saponaria.* He gave an account of the various plants possessing this property as a substitute for soap. He mentioned among others the Californian bulb, *Phalangium pomaridianum,* which has this peculiarity; and expressed the hope that any individual who might have a specimen of it would place it in the hands of Dr. Hayes, who was engaged at the present time in a chemical examination of *Chelaia.*

Prof. Wyman exhibited specimens of fossil teeth of fishes from the Tertiary deposit of Richmond. They belonged to the genus

Phyllodus and exhibited an unusual form. The palatine teeth are composed of three or four central plates, surrounded by others, as is represented in Agassiz's plates of the fossil fishes. A perpendicular section shows them to be made up of several layers, one above the other, sometimes five or six in number, each layer being composed of dentine with a more compact substance above it.

Prof. Rogers said, that he considered the specimens exhibited particularly interesting, as illustrating the relation of the American Tertiary to the deposits of the old world. The genus Phyllodus occurs in the London clay. The eocene and miocene of Europe are more closely related to each other than the layers of Tertiary in America. The Richmond deposit is considered as miocene.

Mr. Desor remarked that the London clay had been regarded of late by some geologists as allied to the miocene. He agreed with Prof. Rogers as to the want of a complete correspondence between the American and European Tertiary, and also with regard to the absence of a close connection between the American Tertiary of different epochs.

Prof. Wyman exhibited a specimen of lignite from the Richmon Tertiary. He stated that at the time it was dug up it was quite moist and so soft that the fingers could be easily thrust through it. After a few weeks exposure to the air it had dried into a hard substance with a fracture like Cannel coal.

Prof. Rogers said, that he had seen a similar hardening of lignite after being taken from the earth. It often contains a resinous matter which hardens in a short time.

Dr. C. T. Jackson read a paper on a mineral named Jacksonite by Mr. J. D. Whitney.

The purport of the paper was to show, that Jacksonite is not a new mineral. This result was based upon examinations made by himself and Mr. Crossley in his laboratory on pieces from the specimen on which Mr. Whitney's examinations were made. Mr. Whitney regarded it as an anhydrous mineral. Mr. Crossley's examination detected 4.84 per cent. of water, — Dr. Jackson's, 4.8 per cent. Adding this amount of water to Mr. Whitney's formula, the result coincides with Walmsteadt's formula for Prehnite, which mineral Dr. Jackson considered it to be.

Mr. Whitney being present, stated that he had full confidence in the results of his own examination of the mineral in question, and he must still consider it a new mineral.

The President exhibited to the Society specimens of different American Sandstones and spoke of their various adaptation to building purposes. The specimens were the Potomac, New Jersey, Connecticut, and Nova Scotia Sandstones. In his opinion of their comparative value, he coincided in general with the views expressed at the last meeting. On that occasion he had spoken more in favor of the Potomac Sandstone, he said, than the nature of the stone would warrant. He was now satisfied that it was inferior to the others. A letter was read by the Secretary, addressed to the President by his request, from Mr. T. J. Bayley, a stone-cutter, on the comparative value of the American Sandstones, giving that from New Jersey the first place, and the Connecticut the next, but hesitating in expressing an opinion as to the Nova Scotia stone for want of sufficient practical acquaintance with it. The President said, he did not think Mr. Alger's suggestion of the substitution of granite for sandstone would be extensively adopted in the construction of public buildings, on account of the superiority of the latter in color and its greater softness.

Prof. Rogers said, he was unwilling to allow the Nova Scotia stone to be passed over as inferior to the others. He had seen it as it came from the quarry, showing no marks of atmospheric action, and of a compact, homogeneous structure. It has the peculiar advantage of occurring in very large beds without any perceptible grain, splitting easily in any direction, and is well adapted to the purposes of coarse statuary.

Prof. Rogers laid before the Society a theory to account for the origin of the green sand of New Jersey.

This sand is found under the microscope to be sharp on its edges, not rounded, or showing any signs of attrition. It is in the form of small granules, like grains of gunpowder, of a dark olive, sometimes greenish color, from the presence of protoxide of Iron. It contains Silica, about fifty per cent.; Protoxide of Iron, twenty; Alumina, seven; Potash, ten; Lime and water. From its physical characters, Prof. Rogers was inclined to regard it as an original deposit. Had it been of mechanical origin it would have contained conglomerates and been mixed with other minerals, which is not the case. Neither is there any green rock known from which it could have been derived. His theory was, that at the time when the southern part of the United States was submerged, the green sand was deposited from the Gulf Stream. The water he supposed to have been charged with soluble silicates of volcanic origin somewhere at the south, perhaps in the region of the West Indies, which were precipitated as the current reached the cooler latitudes of the north.

Dr. C. T. Jackson said, he agreed with Prof. Rogers in his explanation of the green sand deposit. The process would be similar to that of the drying of French green. He suggested thermal springs as another source from which such a deposit might be derived.

Dr. Burnett announced, that he had recently found parasites in the human ovum. They belonged to a species of Conferva similar to the yeast plant. They appeared in triplets, or by twos, and were about $\frac{1}{4000}$ of an inch in diameter. It was difficult to account for the presence of these parasites in such a situation, as their spores would be too large to be deposited from the circulation by passing through the walls of the blood vessels.

Mr. Desor described the origin of the Madreporic body in Starfishes. It had recently been explained by John Müller, of Berlin, as the scar of the attachment of the Starfish to a Medusa-like body by which it is surrounded, and to which it is attached in the embryonic state. Mr. Desor explained this condition by diagrams on the blackboard. He stated the curious fact that he had noticed in the Syncoryne, a similar scar. It was due, he said, to the same cause, the attachment of the embryonic jelly-fish to the parent polyp.

Mr. Alger exhibited some magnified drawings of vermiform mica, from Waterbury, Vt. The mica was found on the surface and in the substance of quartz crystals, and when examined under the microscope was found to present very singular and novel forms, some of them resembling leeches, spiders, &c. It consisted of elongated, hexahedral crystals, twisted and distorted into a variety of shapes.

Mr. Bouvé presented fifty species of fossil shells from the post-pleiocene deposit of Nantucket, from Point Shirley and Augusta, Me., and some from Martha's Vineyard.

Mr. Bouvé exhibited a specimen of Lazulite from North Carolina. The mineral had been analyzed by Mr. Whitney. It is a new mineral in America.

A male Eider Duck, *Somateria mollissima,* and a female Crested Grebe, *Podiceps cristatus,* were presented in the name of Mr. Theodore Lyman. Male and female Purple Sandpiper, *Tringa maritima* were added to the Collection by purchase. The thanks of the Society were voted for Mr. Lyman's donation.

Specimens of Muscle Shells, from Mt. Joy, Me., were presented in the name of Mr. Horatio R. Storer, with the following statement.

The width of the vein was from one to two feet; the shells, when found, were closely packed together and mostly entire; they were at least fifty feet above the level of the sea, and about forty below the top of the hill. The strata above them were of coarse gravel, in which the dip appeared to vary greatly, — the whole surmounted by a layer of large rounded stones, some of which might weigh from 100 to 300 pounds.

The thanks of the Society were voted for the donation.

Adult and young skulls of *Troglodytes niger* were presented in the name of Dr. Savage; Skull of a species of Felis from South America, of a Bat of the genus *Pteropus,* from the East Indies, Skull and pelvis of American Opossum, *Didelphis Virginianus,* were presented by Dr. Lewis.

Dr. Durkee presented a specimen of Grass, species unknown, from Alabama. It is one of the earliest grasses of the spring in that State, and is, when young, much used as fodder for cattle. It grows to the height of five feet.

March 6, 1850.

The President in the Chair.

Thirty-three members present.

Mr. Girard exhibited drawings and read descriptions of several new species of Marine Planariæ of the coast of Massachusetts.

Polyscelis variabilis Girard. This species is oblong shaped, somewhat lanceolated, of a color varying from a light greenish yellow to an orange red, with a minute punctulation of a deeper red. The relative position of the eye specks is subject to some variation. I have found it in Boston and Beverly harbors, always in deep water. It spawns in January and February. Entire length, half an inch.

Prosthiostomum gracile Girard. It differs from other species of the same genus by its very slender body and the arrangement of the eye specks, which are disposed in four groups; of which the first and second are in a single pair, the third triple, and the fourth double. From Boston Harbor.

Procerodes Girard (nov. gen.). Body regular, sides nearly parallel. Anterior region, (head,) separated from the body by a kind of a neck. There are two tentacles in front, as in Proceros, from which it differs, however, by the number and position of the eye specks, of which it has but two. The general form is very different from that of Proceros.

P. Wheatlandii Girard. The only species of the genus yet known. It does not exceed two lines in length, is of a brownish color, and very lively in its habits. I found it last August at Manchester, on the Beach at low tide, in company with Dr. Wheatland of Salem, to whom I dedicate this species in recognition of his zeal as a naturalist.

Planocera elliptica Girard. This species I have mentioned before the American Association for the Advancement of Science when describing its embryology. It is quite common on the sea-coast of Massachusetts. Its greatest size is about three quarters of an inch, its form elliptical, its margin entire, its color grayish yellow. The genus *Planocera* of Blainville is taken here as including *Stylochus* of Ehrenberg.

The following shells from the Exploring Expedition were described by Dr. Gould.

Erycina (Kellia) quadrata. Testa parva, tenuis, ventricosa, ad angulos rotundata, concentricè et concinnè striata, epidermide stramineâ induta; umbonibus ferè medianis, tumidis, anteversis: area cardinalis ampliata, in valvâ sinistrâ tridentata (dente mediano subulato, sub umbone sito; alteris elongatis, compressis) in valvâ dextrâ bidentata; fossâ ligamentali triangulari, declivi. Long. $\frac{1}{2}$; alt. $\frac{2}{5}$; lat. $\frac{1}{4}$ poll. *Hab.* Feejee Islands?

This is a very large species of its type, and closely resembles, in size and shape, *Cyclas similis.*

Tellina tithonia. Testa transversa, oblonga, subequilateralis, zonis et radiis diversis albis et roseis picta, concentricè lirata, liris posticè lamellosis; latere antico semiovali; latere postico breviori, triangulari, ad apicem truncato; plicâ profundâ; margine dorsali recto, declivi; interior incarnata, ad marginem roseo-maculata, versus apicem lutea; dentibus lateralibus satis conspicuis. Long. $1\frac{3}{4}$; alt. $\frac{7}{8}$ poll. *Hab.* Sooloo Sea.

Intermediate between *T. rastellum* and *T. pulchella*, being smaller and of the same shape as the former, but without its peculiar squamous sculpture of the right valve; and being larger and more roseate than the latter, and from a very different locality. It is colored like *T. virgata*, externally, but is more slender, and deeply colored within also.

Tellina lauta. T. parva, solidiuscula, oblonga, inequivalvis, umbonibus ad trientem posticalem longitudinis sitis; latere antico semiovali, margine dorsali recto, latere postico triangulari ad apicem truncato; valvis concentricè liratis (liris striis obliquis anticè decussatis) albis, roseo quadri-radiatis et anticè lineis araneosis rosaceis ornatis; plica inconspicua: cardo dentibus lateralibus carens. Long. $\frac{7}{10}$; alt. $\frac{4}{10}$ poll. *Hab.* ?

About the size, form, and coloring of *T. Valtonis*, Hanley, which appears to be a polished, pellucid shell, with no peculiarity of sculpture. It is very near to *T. rhomboides*, Quoy, which is said to have fine concentric striæ anteriorly, that become obsolete at the middle.

Tellina compta. T. parva, transversa, inequilateralis, alba vel rubescens, quater roseo-radiata ; umbonibus ad trientem posticum sitis ; latere antico semi-elliptico ; latere siphonali triangulari apice truncato, vix insculpto, plicato ; marginibus (scilicet dorsali et ventrali,) ferè parallelis ; disco striis concentricis et striis obliquis arato ; dentibus lateralibus nullis ; intus ex albo flavescens, radiatim striata. Long. $\frac{5}{8}$; alt. $\frac{1}{3}$; lat. $\frac{1}{3}$ poll. *Hab.*

Almost precisely like *T. decora*, which has a well marked lateral tooth, and comes from the West Indies. *T. rhomboides*, Quoy, varies chiefly in the more partial development of oblique striæ. The coloring is less brilliant, and the striæ more delicate, more oblique, and cover a greater proportion of the valve than *T. lauta*.

Tellina exculta. T. transversa, solida, trigono-elliptica, tumida, nitida, albida, rosaceo vix radiata, concentricè liris tenuibus et radiatim striis tenuissimis insculpta ; liris in valvâ dextrâ posticè lamellosis et interruptis, squamas simulantibus ; in valvæ sinistræ disco valdè obliquis ; umbonibus postmedianis ; latere anticali semi-elliptica ; latere posticali subtriangulari, ad apicem valdè truncato ; flexurâ insigni, haud lamellosâ : cavositas flava ; dentibus valvæ dextræ conspicuis. Long. 2 ; alt. 1 ; lat. $\frac{9}{20}$ poll. *Hab.* Feejee Islands.

Looks like a variety of *T. rastellum*, Hanley, (*T. Philippii*, Anton,) but is proportionally shorter, the beaks are farther back, and the disc is more tumid anteriorly. The laminæ of the right valve are everywhere more delicate, and nearly absent on the anterior half ; the scales are confined to the valley in front of the fold. The oblique grooving on the left valve is very decided.

Tellina concentrica. T. transversa, ovato-trigona, tenuis, convexiuscula, albida, haud nitida, ubique concentricè lamellosa, et radiatim inter lamellas subtilissimè striata ; lamellis æqualibus, acutis, confertis, reflexis ; umbonibus vix post-medianis : pars antica semi-elliptica ; margine dorsali vix declivi : pars postica sub-triangularis ; margine dorsali valdè declivi, sub-arcuato, valdè excavato, ad apicem truncato ; flexurâ conspicuâ, haud lamelloso: intus alba. Long. $1\frac{5}{8}$; alt. $1\frac{1}{8}$; lat. $\frac{1}{2}$ poll. *Hab.* Feejee Islands.

Like *T. capsoides*, Lam., but less triangular, the anterior portion more tumid, and its dorsal slope arcuate; the flexure is more decided; the concentric laminæ decided and uniform throughout; the radiating striæ are very delicate, and found equally before and behind, not crossing the concentric laminæ. It is much like *T pristis*, Lam., except in form, and its anterior margin, which is represented as serrated.

Tellina perula. T. parvula, solidiuscula, ventricosa, rotundato-triangularis, eburnea, concentricè et remotè striatula; umbonibus tumidis, submedianis, radiis binis lacteis ornatis; marginibus dorsalibus valdè declivibus; latere antico rotundato, tumido; latere siphonali brevi, valdè flexuoso, infra angulato; margine ventrali pendulo; cavositatis limbo albo, disco sulphureo; dentibus lateralibus conspicuis. Long. $\frac{1}{2}$; alt. $\frac{2}{5}$; lat. $\frac{3}{20}$ poll. *Hab.* Feejee Islands.

Very much like *T. casta*, Hanley, which is described as pellucid, and no mention is made of the yellow color of the interior, or of the two white umbonal radiations. One specimen is tinted and zoned with rose red, and the interior is wholly red, preserving however, the umbonal white rays.

Psammobia florida. Testa transversa, oblonga, tenera, polita, purpurascens, posticè albo-radiata; limbo epidermide flavo-virescente induto; natibus postmedianis, inconspicuis; latere antico semi-elliptico, apice supra-mediano; latere siphonali angustato, acutè rotundato, apice infra mediano; margine ventrali rectiusculo: interior incarnata; sinu siphonali angusto, prælongo; cardine dentibus duobus minutis divaricantibus in utrâque valvâ instructo. Long. $1\frac{1}{4}$; alt. $\frac{7}{10}$ poll. *Hab.* Illawarra, N. S. Wales.

A shell closely resembling in structure and exterior coloring *Machæra costata.* It has the form of *P. vespertina*, except that the beaks are removed much further backwards.

Donax pallidus. Testa transversa, ovato-triangularis, solidula, convexa, exalbida, posticè concentricè sulculata, anticè polita; umbonibus postmedianis; margine dorsali utrinque declivi (præcipuè retro) convexiusculo; latere antico semi-ovali, sensim angustato, ad apicem rotundato; latere postico sub-triangulari, rotundato; margine ventrali valdè arcuato, posticè sinuato: interior eburnea, incrassata; dentibus modicis. Long. $\frac{3}{4}$; alt. $\frac{1}{2}$; lat. $\frac{1}{4}$ poll. *Hab.* Singapore.

The outlines are all gently rounded, and the shell is otherwise characterized by its dead, sallow-white color, and its sculpture.

DONAX TINCTUS. Testa crassa, ovato-trigona, cuneata, versicolor, scilicet incarnata, straminea vel violacea, striis lamellosis concentricis posticè flexuosis insculpta; umbonibus ferè medianis; margine interiori integro; dente laterali valido; dente antico obsoleto. Long. $\frac{17}{20}$; alt. $\frac{7}{10}$; lat. $\frac{2}{5}$ poll. *Hab.*

It comes near to *D. cuneata*, but is still more like *Mesodesma striata* in general aspect. The specimens I have examined vary greatly in color, but correspond in form, sculpture, and other characters.

DONAX CROCATUS. Testa parva, tenuis, transversa, ovato-triangularis, inequilateralis, dilutè crocea, concentricè lamelloso-sulcata; latere antico semi-ovato; latere postico breviori, rotundato-truncato; margine ventrali lentè arcuato: intus flavida, nitida; cardine valido. Long. $\frac{2}{5}$; alt. $\frac{1}{4}$; lat. $\frac{3}{20}$ poll. *Hab.* Mangsi.

This small species is sufficiently well characterized, somewhat like *D. scalpellum.*

LUCINA RAMULOSA. Testa crassa, scabra, lenticularis, vix obliqua, albida, costulis radiantibus crebrè divaricantibus et filis continuis concentricis crebris insculpta; umbonibus elevatis acutis antrorsum versis; lunulâ excavatâ, haud insculptâ: cavositas albida vel citrina, incrassata; cicatricibus profundis; limbo concinnè radiato-striato; cardinis dentibus lateralibus validis. Diam. 1; lat. $\frac{1}{2}$ poll. *Hab.* Paumotu Islands.

As much allied to *L. tigerina* or *L. interrupta* as to any described species, but is more circular, more solid, and the peculiar divergence of the radiating ridges, somewhat like *Cytherea divaricata*, are sufficiently characteristic.

LUCINA INCULTA. Testa tenuis, lenticularis, retrorsum nonnihil obliqua, stramineo-albida, concentricè striolata; natibus medianis, elevatis, acutis, contiguis, antrorsum versis; latere antico supernè subangulato, excavato; latere postico rotundato, infra paululum producto: cavositas albida; cicatricibus perspicuis: cardo invalidus; dentibus apicalibus duobus divaricatis, lateralibus nullis. Diam. $\frac{3}{4}$; lat. $\frac{3}{8}$ poll. *Hab.* New Zealand.

Very much like *L. filan*, but much smaller, more solid, and less glossy. The anterior end is less developed, and the bulk of the shell, as well as its most depending portion, is behind, instead of before, the beak.

Lucina vesicula. Testa tenuis, sub-globosa, vix obliqua, pallidè flavescens, concentricè tenui-striata, radiatim obsoletè striata: natibus submedianis, elevatis, anteversis; margine dorsali anticè excavato, demum subalato, posticè rectiusculo; peripheriâ reliquâ circulari; cardine edentulo; ligamento in fossam obliquam internam posito: concavitas flavescens, punctis nitidis notata. Long. $1\frac{1}{4}$; alt. $1\frac{1}{8}$; lat. $\frac{7}{8}$ poll. *Hab.* Tongataboo.

Its surface is like *L. filan*, but its form is more ventricose, and its dorsal margin is much less sloping, somewhat alate; and this is one of its most striking peculiarities. In form it is more like *L. undata*, except that the reverse extremities correspond.

Lucina lenticula. Testa parva, solidula, lenticularis, rotundata, convexiuscula, concentricè imbricato-striata, etiam striis radiantibus decussata, alba, epidermide fuliginoso hic illic induta; umbonibus ferè medianis, prominulis: cardo dentibus apicalibus et lateralibus tenuibus instructus: intus incrassata, alba; margine crenulato; impressionibus profundis. Diam. $\frac{2}{5}$; lat. $\frac{3}{10}$ poll. *Hab.* Coast of Patagonia?

This little shell has rather the aspect of an Astarte or Cyprina, and would be considered as such but for its lateral hinge teeth.

Prof. Johnston, present by invitation, gave at the request of the President, an account of the Green Sand deposits of England.

The green sand deposit in the southeast part of England had long been known for its fertilizing properties, and it is extensively used for manuring the hop lands in that quarter. He attributed its fertilizing power to the presence of phosphate of lime, of which it contains fifteen or twenty per cent. He mentioned the existence, in the eastern coast of England, of extensive beds of nodules of phosphate of lime, which are used as a manure with a similar good effect. Some of these nodules are casts of Ammonites and other fossils. Similar fossils he thought would be found in all the green sand deposits of the Continent. They had been found in Hanover and in France. During his stay in Boston his assistant had analyzed, at his suggestion, two specimens of the New Jersey green sand, and found in one 1½ per cent. and in the other 1 per cent. of phosphate of lime, a smaller quantity than had been looked for, but constituting, he thought, the fertilizing element in this deposit.

Dr. Jackson asked if Prof. Johnston had noticed any fertilizing property in phosphate of iron, as this mineral occurs in the green sand of New Jersey in considerable quantities, sometimes filling fossil shells with its crystals. Prof. Johnston replied, that he had never seen it in such quantities, but if it were mixed with marl it would make phosphate of lime.

Dr. Pickering confirmed Dr. Jackson's statement as to the presence of phosphate of iron in the New Jersey green sand, and mentioned another ingredient of fertilizing power, namely, potash.

Mr. Desor inquired if Prof. Johnston's statements had reference to the upper or lower layer of green sand ; he replied, that he spoke of both.

Dr. Jackson said he thought if phosphate of iron could be made useful for agricultural purposes, that bog iron ore combined with lime would be of similar use.

Prof. Rogers said, that he had long held the opinion that the alkali is the fertilizing ingredient in the green sand of New Jersey, although he had been aware of the presence of phosphates, which he had considered as belonging to the clay included in the sand. In preparing the sand for chemical analysis the clay was washed out, removing with it the phosphate of lime. This would account for his failure to detect this element in the pure green sand. He was still of opinion that the potash was a fertilizing ingredient, as he had seen from 100 to 200 bushels of Indian corn to the acre, raised upon loose sand which had been manured with it.

Mr. Desor exhibited to the Society a shark's tooth from the lime stone deposit at Keokuck, Iowa, on the right bank of the Mississippi. It resembled the teeth of the genus Psammodeus. The specimen was worn on the posterior surface from the juxtaposition of another tooth. It was composed of very loose dentine, but at the base was a layer of more compact substance, making it the type of a new genus. From its general resemblance to the teeth of the Port Jackson Shark, which, however, are much smaller, an inference might be drawn as to the size of the species. The Port Jackson Shark being three or four feet in length, the size of this species must have been very great.

There was a doubt, Mr. Desor remarked, as to the true geological position of the limestone from which the specimen was procured. The Western strata cannot be so readily referred to those of Europe as those of the eastern parts of the United States. The distinctive traits of the strata of the East diminish on going West. These strata mark the existence of a vast ocean, the shore of which was along the Atlantic coast. He saw, however, no reason to infer that the Western deposits were *deep sea* deposits, the existence of fossil corals and Echinoderms which live in water of moderate depth would indicate the contrary. He thought that many of the eastern deposits would be reduced to one epoch. If at the present time we suppose an elevation of the sea shore for a few feet, there would be a succession of strata of various composition similar to those referred to.

Prof. Rogers said, that he had sometime since announced the view that the New York and Pennsylvania beds of limestone were of littoral origin, their outlines becoming confused and blended on going west, until in the district of Cincinnati they come in contact with the overlying clay, which in the east is separated from it, making one common mid sea deposit of limestone. This is shown by the diminishing size of the pebbles and the thinning of the layers as they recede from the east. In a similar way the palæozoic horizons became confused towards the west. The deposits which overwhelmed the animals of the east did not reach the west, and they continued to live, so that the inhabitants of different strata in the east occur together in the west. Thus, where there was a layer of thick mud in the east there is found in the west a deposit of thin clay, forming shales interposed in the limestone. Prof. Rogers said, in conclusion, that he thought the attempt to identify the palæontological character of the deposits of different seas unphilosophical.

Dr. Kneeland stated that he had found the internal capacity of the crania of *Troglodytes niger*, presented at the last meeting, to be, that of the young specimen (which was a male) 26.5 cubic inches, that of the adult female, 25 cubic inches. There was a want of symmetry between the superior maxillary bones in the latter, and the nasals were pushed to the right.

Prof. Wyman said that Dr. Kneeland's statements confirmed a statement of his own, that the capacity of the cranium of the male *T. niger* is greater than that of the female. The capacity of the cranium of *T. gorilla* is not in proportion to the external size, or size of the animal, that of the female being 25, of the male 28 cubic inches. This is an important fact as bearing upon its proper position with reference to the other ourangs. Prof. Owen had placed *T. gorilla* first, a position not sustained by this fact. Prof. Wyman remarked that the form of the cranium in the young Ourang approaches more nearly to that of man than does that of the adult, a fact seemingly at variance with the general law.

Prof. Wyman remarked, in allusion to Dr. Burnett's observations on parasites in the human ovum made at the last meeting, that such parasites occur normally in many animals. In man they are generally found in diseased parts. He had found them in the mucus of the posterior nares of a bear, in the form of cells with nuclei, grouped together in an elongated series, which was sometimes branched.

Prof. Rogers laid before the Society a theory to account for the origin of salt lakes.

He thought that the existence of these inland seas was connected with the laws of climatology. In all instances they were without outlet. On regarding their position it would be found that they only exist in those regions where there is an excess of evaporation over the amount of rain. This was true of the Caspian, Sea of Aral, the Dead sea, and the seas of Central Asia. He believed that the salt was brought down by the rivers flowing into these lakes, they having derived it from the disintegration of volcanic rocks. As it accumulated, the water became strongly impregnated with it. It had been thought that the Great Salt Lake of Western America derived its supply from deposits of rock salt in the neighborhood, but he thought it would be found that these deposits indicated the former borders of the Lake, when it was higher than now. The ocean itself might be regarded as a great lake without an outlet. It probably derived its saline materials from the rivers flowing into it, or from volcanic eruptions, principally, however, from the former source.

In confirmation of Prof. Rogers's views, Dr. Jackson stated, that the water of the river Jordan was found on evaporation to contain the same ingredients as the Dead Sea, into which it flows.

Dr. Jackson presented, in the name of General Caleb Cushing, a skull from Mexico, which, from the character of the objects found with it, he believed to be an undoubted Aztec skull. The thanks of the Society were voted for the donation.

A specimen of *Alca torda*, Razor-billed Auk, young, was presented in the name of Mr. Theodore Lyman. The thanks of the Society were voted for the donation.

Mr. Desor presented a specimen of Ground Squirrel, *Tamias quadrivittatus,* from the shores of Lake Superior.

A specimen of *Tetraodon* was presented in the name of Dr. Storer.

March 20, 1850.

Dr. C. T. Jackson, Vice-President, in the Chair.

Present, twenty-four members.

Mr. Teschemacher exhibited to the Society several specimens of Palms from the country back of Singapore. They were all of the creeping or climbing order of Lepidocaryinæ, namely two species of Zalacca, one of Dæmonorops, one of Metroxylon. He also exhibited what he supposed a new vegetable acid from the fruit of Metroxylon by boiling in water, saturating with lime, and precipitating by sulphuric acid, — repeated washing and crystallization; — it was pure white, and had characters differing from any he knew of. He had the alkaline salts in process of crystallization. The chief object of his exhibition of these Palms was to show several agreements between them and the vegetation of the coal period, of which he exhibited specimens in the anthracite coal itself. He observed, that in the most recent work on this subject, Unger's Synopsis, published in 1845, the only species of Palms noted as occurring in the coal, are *Flabellaria borassifolia*, *Zeugophyllites calamoides*, and *Paleospathe Sternbergii;* others have been found in bituminous shales, but the largest part of the fossils, considered as Palms, have been found in much later formations. Nœggerathia of Sternberg is considered by Unger as a Neuropteris, or one of the Neuropterides, while Brongniart's latest opinion, 1846, places it amongst the Pinus tribe; to this latter, there is in his opinion, much objection. He thought he could show that the Palms formed a more considerable portion of the coal vegetation than had been supposed.

On six or eight specimens of the coal the vegetable fossils were interspersed with round concavities, from a very small size to a quarter of an inch diameter, some of them surrounded by stellate fissures and filled with a black powder; he had long considered these as a fungus growth; on the recent specimens he exhibited precisely the same appearances, so that no doubt could exist of the correctness of this opinion.

He observed, that although the existence of this fungus on the recent palm is no distinct proof of the fossil plant being a palm, as the same fungus may also vegetate on *Gramineæ*, *Calamiteæ*, or *Filices*, yet as the fossil stem and its structure resembles that of the palm, this evidence is of some weight. He then exhibited other much larger and more extensive stellate appearances on the fossils, each with its nucleus, which he thought also belonged to the fungus tribe, particularly as in one specimen they were connected together.

He then exhibited many specimens of fossil vegetables in coal, containing horizontal fissures across the vegetable structure, these being curved and irregular in various ways, he compared with the veins in the various recent palm leaves, which are also horizontal, and explained that these veins being composed of annular vessels, under vertical pressure would form exactly such fissures as are observed in the fossil. The only difficulty attending this explanation was, that some fossil specimens contained these horizontal fissures of such large dimensions that some of these foliar appendages must have been of much larger size than any now existing; still he thought he could produce other fossil proof of the existence of this enormous foliage.

He also pointed out on some specimens what he thought must be large vertical sections of vegetable stems.

In reply to a question from Prof. Rogers, Mr. Teschemacher said, that under the microscope the coal striæ lose their definite outline, and no organic texture is made out.

Prof. Rogers said, that in many specimens he could see no trace of vegetable substance, and he thought the fissures might have been caused by fracture. He thought that vegetable structure would manifest itself, if it existed, under the microscope. He was inclined to question the accuracy of Mr. Teschemacher's hypothesis as to the origin of the silicic acid in the fissures. He thought that that, as well as the scales of silica found in anthracite, might have been deposited by sublimation. He must, therefore, he said, renew his demurrer, formerly expressed, as to the soundness of Mr. Teschemacher's theory.

Mr. Teschemacher said in reply, that he had specimens which had been ground and polished, which, under the microscope, showed a structure precisely like that of palms.

Dr. Burnett read a paper on the Embryology of Articulata, as illustrating some obscure phenomena in the physiology of generation.

He explained in detail the successive development from the ovum of the different parts in the animals of this order. In the formation of the extremities of insects, a process takes place similar to that of the first stages of development of the whole body. As the whole body was at first a cylindrical blastemal mass, subsequently marked by transverse grooves indicating its articulated character, so the limbs are primarily cylindrical tubes, afterwards divided transversely into different joints.

Dr. Burnett expressed the opinion, that the true typical characteristics of species belong to the primitive ovum; and consequently little weight should be given to the theory of the change of such characters, or the introduction of new ones by external influences. Thus, as the wings of insects are only expanded tracheæ, and consequently belong to their primitive characteristics, their actual existence might have been predicated at an earlier period than they had been supposed to exist before the recent investigations of Burmeister and Agassiz.

Dr. Burnett spoke of the singular facts observed in the generation of the Humble Bee and Aphides. In the former, three successive broods of offspring are produced from one act of impregnation; the first brood, he believed, being alone produced from eggs directly impregnated. In the Aphides, a succession of broods is produced, sometimes to the number of ten or eleven, each being the offspring of the preceding, and all the result of the impregnation of the parent of the first.

Dr. Burnett proceeded to examine Owen's and Steenstrup's views as to the nature of the process by which this succession of generation was effected, stating that they did not accord with his own. He thought the phenomena were not anomalous, but consistent with the highest and most philosophical views of the essential nature of generation. He explained the process, which he had observed, of the division of the sperm cell by which the spermatozoon is produced, describing it as similar to the division of the ovum in the female. The function of the spermatozoon was to awaken, by contact, the slumbering force which led to the formation of the embryo in the ovum, — a process similar, he thought, to that in the inorganic world known as the process of catalysis, as in the instances of the immediate magnetizing of iron by contact with a magnet, and the production of water from a union of hydrogen and oxygen by the contact of spongy platinum. As the particles of magnetized iron have the power of transmitting to others by mere contact, the property communicated to them, so the cells of the ovum, being, so far as is known, in their nature precisely similar to each other, may in certain instances be supposed to be able to communicate to another ovum the force which has spread to them all, from the contact of a spermatozoon. In the case of the Aphides, the females which are produced directly from the act of impregnation, retain in themselves the property of awakening the power of development in the ova produced in their ovaries, and this power is transmitted from one brood to another until it finally dies out, — a process which seems to have its analogue in the disposition to the production of adventitious growths in the ovary, which is sometimes seen to be hereditary in the human female. In the Humble Bee it would seem that the ova from which the first brood are produced, are fertilized directly by spermatozoa; that ova transmit the awakened force to those which produce the second, and these in their turn to those which produce the third.

Mr. Girard read descriptions of two marine species of Planariæ, in addition to those given at the last meeting, as follows: —

VORTEX WARRENII Girard. General form elongated, sides nearly parallel; anterior and posterior extremities rounded. Small species, reddish brown, found on the shores of Boston Harbor. Not common.

VORTEX CANDIDA Girard. Body elongated, tapering away towards the posterior extremity; head rounded; sides entire; almost transparent, of a pale rose color. From Chelsea beach, found attached to the Horse-shoe Crab. Length, a quarter of an inch.

The generic position of these two species is still a matter of doubt; the genus Vortex not being as yet well circumscribed.

He then gave a brief account of the fresh water species of this family, known to him as the inhabitants of this country, as follows: —

PLANARIA GRACILIS Haldem. Suppl. to a Monogr. of Limn. &c. 1840, p. 3. Common about Cambridge in pools and rivulets.

PLANARIA TIGRINA Girard. Of this species I have seen but one individual in a damaged state, but showing itself distinct from all those I have known, being of a dark brownish color, dotted with large white spots, and smaller and more numerous black ones. Found in the State of New Jersey.

Obs. *Planaria gracilis*, and very likely *Planaria tigrina* will not remain in the genus Planaria as soon as we shall know their internal structure.

DENDROCŒLUM PULCHERRIMUM Girard. The largest species of that family hitherto known in the fresh waters of this country. It resembles *D. lacteum*, of northern Europe, from which it differs by having three pairs of eyes instead of one. From New Jersey.

DENDROCŒLUM SUPERBUM Girard. Of this species I know two varieties: the one is red, or rather delicate rose, the other milky white. They are of a much smaller size than the preceding, and are very common in rivulets, ponds, and pools of our vicinity. It reminds us of *Pl. vitta*, Dugès, which must be placed in the same genus.

Thus, the genus Dendrocœlum, of Œrsted, created by that naturalist for the *Planaria lactea*, of Müller, would embrace three species more, the *Pl. vitta*, of Dugès, and the two above mentioned.

I would propose a new genus for one species of this country, which bears some striking resemblances to the *Planaria gonocephala*, of Dugès, which I would take for the type, and call the genus.

DUGESIA Girard. The anatomical character I am not yet prepared to give. As for the external appearance, the body is slender, elongated, tapering away posteriorly. The head, somewhat detached from it, is triangular, the summit of the triangle in front.

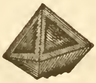
DUGESIA GONOCEPHALOIDES Girard. Has been found in Massachusetts and New Jersey, and will probably be found over a greater extent. It is quite common in ponds and rivulets, and differs from Dugès's *Pl. gonocephala* by the oblong shape of the transparent space which surrounds the eyes, whilst in *Pl. gonocephala* that space is circular. There are also two pairs of eyes in the American species.

He concluded with a general description of the organization of these animals as illustrated by M. de Quatrefages.

Prof. Rogers exhibited a large diagram showing the principal features of Johnston's Physical Atlas. On it were displayed the principal deposits of salt in the desert and semi-desert regions of Northern Africa and Central Asia. He stated, that since the last meeting he had discovered that Darwin, in his account of his exploration of California and South America, had attributed the occurrence of salt Lakes without outlet to the same cause that he had suggested, the washings of rivers flowing into them. Angelot had proposed a similar hypothesis. Da Jean thought that such Lakes, with a level below that of the sea, were more salt than those above it, for the reason that they had probably been cut off from it and had lost a part of their water by evaporation. That this was not a true generalization was shown by the fact, that the Great Salt Lake of California is almost a saturated solution of salt. The only point, therefore, in the hypothesis for the origin of these Lakes, which Prof. Rogers said he could claim as new, was the generalization that these salt Lakes only occur where the evaporation exceeds the amount of rain ; and he considered this observation a contribution to geological science, as aiding in illustrating the climate at different geological epochs.

The saline deposits in the earth, even the rock salt, he believed to have been formed by washings like the salt lakes of the present time, and that they indicated the existence of dry climates analogous to the present.

Mr. Alger exhibited specimens of crystallized gold from California.



One of them was an octohedron of the dimensions of the figure annexed, being $\frac{5}{16}$ of an inch in diameter at the base of the pyramid, and having four pretty regular faces, with three of the solid angles perfectly formed to a point — two of the faces were depressed, one of them into a very deep cavity surrounded by a pretty uniform border parallel with the edges which unite with the adjoining planes of the crystal. It appears as if the crystal had been in a liquid state, and that soon after the outer portion, or the surface of the planes, had congealed, the interior yet fluid parts had run out, thus leaving the consolidated edges around the cavity. Mr. Alger had seen something similar to this formed in the same way among artificially produced crystals, as for example, pure lead and lead ore partially desulphuretted, where the metal flowed out after an outer crust had formed over some of the faces of the crystals. The great size of this crystal, and the fact that the large cavity contained oxide of iron possibly derived from pyrites, had led some to regard it as a pseudomorph of sulphuret of iron. He was not disposed to ascribe any such unnatural and forced origin to this beautiful production. He believed it to have been formed under the ordinary circumstances of crystallization, and in a matrix so soft as to give it full freedom to take its proper form. In Haüy's time, crystals of gold in the form of the cube were very rare, so much so that he speaks of them with some degree of doubt, and gives no such figure. Mohs says, *they* are often hollow, while the *octohedrons* are smooth. Beudant says the crystals are usually very small; Cleaveland says, that they are small and imperfect. Nicol, in his late work on Mineralogy, says of gold crystals in general, "they are small and very small."

Mr. Alger also exhibited Cinnabar, from California. He presented, in the name of Mr. George E. Tyler, three bulbs of the Soap Plant, *Phalangium pomeridianum,* from California, with the following letter, giving an account of its mode of growth, &c. The thanks of the Society were voted for the donation.

The Soap Plant grows all over California on high hills as well as in low vales. The leaves make their appearance about the middle of November, or about six weeks after the rainy season has fairly set in; they never grow more than one foot high, and the leaves and stalk drop entirely off in May, though the bulbs remain in the ground all summer without decaying. It is used to wash with, in all parts of California, and, by those who know its virtues, it is preferred to the best of soap.

The method of using it is merely to strip off the husk, dip the clothes in water, and rub the bulb on them; it makes a thick lather, and smells not unlike new brown soap.

The specimens I send I procured at San Francisco on a hill, the soil of which was fine gravel. I procured it January 10, 1850.

A donation of $20 was announced, from Mr. G. Howland Shaw, for the department of Comparative Anatomy. The thanks of the Society were voted for the donation.

A large mass of conglomerated fossil shells from the Richmond tertiary was presented by the President, in the name of Dr. J. V. C. Smith.

Mr. Charles F. Hovey was elected a member of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING MARCH 31.

Traité de Minéralogie, par Haüy. 5 vols. 8vo. Paris, 1801. *From Dr. C. T. Jackson.*

Natural History of New York. 15 vols. 4to. New York, 1843. *Deposited by Republican Institution.*

Annals and Magazine of Natural History. No. 24, for December, 1849. 8vo. London. *Courtis Fund.*

United States Exploring Expedition. Atlas. Zoöphytes, by James D. Dana, A. M. Folio. Philadelphia, 1849. *From Francis Alger.*

A Description of two additional Crania of the Engé-ena. By Jeffries Wyman, M. D. 8vo. Pamph. Boston, 1849. *From the Author.*

The Western Journal. Edited by M. Tarver and T. F. Fisk. 8vo. Pamph. Vol. III. Nos. 1, 2. St. Louis. *From the Editors.*

The Family Visitor. Edited by J. P. Kirtland, S. St. John, and C. H. Knapp. 4to. (Newspaper). Cleaveland, Ohio. Vol. I. N. 1. *From the Editors.*

Bulletin de la Société Géologique de France. 2ieme serie. Tome 6ieme. Feuilles 27 - 34. 2 Avril — 18 Juin, 1849. *From the Société Géologique.*

Bibliothèque Conchyliologique, Chenu. Première serie. Vol. I. 2ieme serie. Vols. I. - IV. 8vo. Paris, 1845. *Deposited by Mr. Desor.*

New Species of Myliobates from the Eocene of South Carolina. By R. W. Gibbs. 4to. Pamph. Philadelphia, 1849. *From the Author.*

Memoirs of the American Academy of Arts and Sciences. New Series. Vol. IV. Part 1. 4to. Cambridge, 1849. *From the American Academy.*

Annals and Magazine of Natural History. For January, 1850. 8vo. Pamph. No. 25. Vol. V. London. *Courtis Fund.*

Icones Plantarum. By Sir William J. Hooker. Vols. I.–III. New Series. 8vo. London. 1842–4. *Deposited by Republican Institution.*

Monographia Apum Angliæ. By William Kirby. 2 vols. 8vo. Ipswich (England.) 1842. *Deposited by Republican Institution.*

Lectures on Comparative Anatomy and Physiology of the Vertebrate Animals. By Richard Owen. Vol. 2nd, Part I. Fishes. London, 1846. *Deposited by Republican Institution.*

Outlines of Comparative Anatomy. By R. E. Grant. 8vo. London, 1849. *Deposited by Republican Institution.*

Elements of the General and Minute Anatomy of Man and Mammalia. By Fr. Gerber. With Notes, &c. by George Gulliver. 8vo. London. 1 vol. and 1 vol. 8vo. of Atlas. *Deposited by Republican Institution.*

Cyclopædia of Anatomy and Physiology. By R. B. Todd. 8vo. Nos. 1–37. London. *Deposited by Republican Institution.*

Monograph of the Anatidæ or Duck Tribe. By T. C. Eyton. 4to. London, 1838. *Deposited by Republican Institution.*

Icones Avium. By John Gould. Parts 1, 2. Folio. London, 1837. *Deposited by Republican Institution.*

Descriptions of Two Species of Distoma. By J. Leidy, M. D. 4to. Pamph. Philadelphia. 1850. *From the Author.*

Journal of the Academy of Natural Sciences of Philadelphia. New Series. Vol. I. Part. IV. 4to. Philadelphia, 1850. *From the Academy of Natural Sciences.*

Plates to Magnetic and Meteorological Observations at Girard College. 8vo. Washington, 1849. *From R. C. Winthrop.*

Illustrations of British Entomology. By J. F. Stephens.

12 vols. 8vo. London, 1846. *Deposited by Republican Institution.*

G. Cuvier. Règne Animal, Crustacés. 2 vols. 8vo. Paris. *Deposited by Republican Institution.*

Encyclopædia Americana. 14 vols. 8vo. Philadelphia, 1849. *Deposited by Republican Institution.*

Silliman's American Journal of Science and Arts. No. 26, for March, 1850. *From the Editors.*

Annals and Magazine of Natural History. No. 26, for February, 1850. London. *From the Courtis Fund.*

De Candolle. Prodromus Systematis Naturalis Regni Vegetalis. Vols. 5 – 7 to 4, and 13. 8vo. Paris, 1843. *Deposited by Republican Institution.*

Botany of the Antarctic Voyage of the Erebus and Terror. By J. D. Hooker. 17 Nos. 4to. London, 1845 – 6. *Deposited by Republican Institution.*

Cuvier, Règne Animal, Atlas. Vol. 2nd. Texte. Vol. 2nd. 8vo. Paris. *Deposited by Republican Institution.*

Annales de la Société Entomologique de France. Nos. 1, 2. Vol. VII. Paris, 1849. *Deposited by Republican Institution.*

Traité Générale d'Anatomie Comparée. Par J. F. Meckel. 10 vols. 8vo. Paris, 1836. *Deposited by Republican Institution.*

Cuvier et Duvernoy. Leçons d'Anatomie Comparée. Tome 8^{ieme}. 8vo. Paris, 1846. *Deposited by Republican Institution.*

Isomorphism and Atomic Volume of some Minerals. By J. D. Dana. 8vo. Pamph. 1850. *From the Author.*

Synopsis of the Genera of Gammaracea. By J. D. Dana. 8vo. Pamph. 1849. *From the Author.*

United States Exploring Expedition. Vol. VIII. Zoöphytes. By J. D. Dana. 4to. Philadelphia, 1848. *From Francis Alger.*

G. Cuvier. Règne Animal. Poissons. Texte, 1 vol. Atlas, 1 vol. 8vo. Paris. *Deposited by Republican Institution.*

G. B. Sowerby, Thesaurus Conchyliorum, Part X. 8vo. Pamph. London, 1840. *Exchange.*

Proceedings of the Zoölogical Society of London. Parts I. and II. January, — July, 1849. 16 Plates. *From the Zoölogical Society.*

Annals and Magazine of Natural History. No. 27, for March, 1850. *Courtis Fund.*

Zoōlogy of the Voyage of H. M. S. Sulphur. 2 vols. 4to. London, 1844. *Deposited by Republican Institution.*

L'Histoire de la Nature des Oyseaux, &c. Par Pierre Belon du Mans. Long 4to. Paris, 1555. *From J. W. Thornton.*

April 3, 1850.

The President in the Chair.

Present, thirty-four members.

Dr. Durkee presented a number of dried specimens of American Marine Algæ. He read a paper, giving an account of their structure, chemical constituents, habits, and distribution, concluding with some statistics of the manufacture and commercial value of Kelp. His observations were illustrated by the specimens presented, and others which he exhibited, as well as by drawings on the blackboard.

He was followed by the Rev. John L. Russell, who touched upon certain points not fully treated by Dr. Durkee, giving an account of the recent opinions of botanists as to the nature of the process of reproduction in these plants. In reply to a question from Mr. Desor, he said, that Confervæ do not grow in fresh water of any considerable depth. Having alluded to the opinion that the Edible Swallow's nest is composed principally of a substance derived from Algæ, Dr. Cabot stated, that recent observations have shown that these nests are principally composed of the secretion of the salivary glands of the Swallow. A substance similar in character is a component part of all Swallows' nests.

Dr. Gould mentioned, that recently Prof. Harvey had stated, that he had found the coast of the United States to be divided into three distinct regions, as exhibited by the character of the Algæ. Dr. Gould considered this a very interesting fact, as it coincided with Lieut. Maury's views in connection with the currents on the coast, and his own observations of similar divisions in the Fauna.

Dr. Kneeland read a paper on the Aztec skull recently presented by Col. Cushing.

His description of the specimen was prefaced by a synopsis of the opinions of Ethnologists and the traditions as to the origin of the race to which it belonged. From a careful comparison with published descriptions he was satisfied that it belonged to the Toltecan family.

It very nearly resembled No. 18 of the Plates of Dr. Morton's Crania Americana. The diameters which it was possible to take with any accuracy are: —

L. D.	P. D.	F. D.	I. M.	Oc. F.	H. P.
Inches.			Arch.	Arch.	
6.6	5.7	4.4	15.	14.5?	20.

In connection with this subject Mr. Desor said that Mr. Foster had recently ascertained that the copper tools found in the Ohio mounds are made of the Lake Superior copper, an indication of the degree of civilization of the builders.

Dr. Jackson said that Dr. Locke, of Cincinnati, had made the same observation. He did not himself regard the facts mentioned as indicating of necessity any higher degree of civilization than exists among the Indians of the present day. It was well known that particular articles were extensively circulated by exchange among the old Indian tribes, and are found at great distances from their primitive origin; such, for instance, as the arrow-heads of Maine, which are found in great numbers in Massachusetts and New York.

Dr. Cabot mentioned, as another illustration, that the obsidian of the Mexican volcanoes is found in Yucatan, and also far to the north, even in the Ohio mounds.

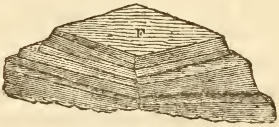
Dr. Burnett exhibited specimens, and gave an account of a disease extensively prevalent in sweet potatoes. It was very destructive in its character, rapidly extending throughout a large quantity of them where one had become affected with it, reducing the potato to a soft-solid pulp. On examining it with the microscope he had found two species of fungus similar to the fungus in the common potato affected with the rot. Large numbers of flies of the species *Anthomyia radicum?* issued from the barrels containing the diseased potatoes, but he thought they had no connection with the origin of the disease, but were propagated on their surface.

Mr. Russell said, he felt confident after numerous investigations, that the fungi were not the cause of the rot in potatoes, they were only a consequence. He thought the rot to be either analogous to dry gangrene or else quite inexplicable.

Mr. Russell presented a package of specimens of Lichens and Musci, collected at Lake Superior by Mr. Desor. He said, that he had examined under the microscope sections of the wood from the terraces of Lake Superior, thought by Mr. Desor to be cedar, and had ascertained that they were not cedar, but some hard wood.

Mr. Alger offered some remarks on a singular cavity presented by one of the quartz crystals from Waterbury, Vermont.

He said that he had, on a former occasion, called the attention of the Society to the beautiful crystals from Waterbury, which were permeated in every part by acicular prisms of rutile. He wished now to exhibit a specimen which had recently come into his possession, and which was marked by a peculiarity hitherto unobserved. It presented on one of its transparent faces a rhomboidal cavity, one inch in width, and about half an inch in depth. It might at first sight be mistaken for the impression left by some substance which had become surrounded by the quartz, and had since disappeared by decomposition. But no substance having such form had been found attached to any of the crystals from this place, nor did it seem probable that any crystallized mineral could assume the exact conformation required to fill up the cavity. The angles at which the sides meet each other are about 74° and 106°, or nearly those of calc-spar or carbonate of iron. Could either of these have formed the cavity? It is evident from the internal form of it that they could not; and if any substance ever occupied the space, it got there by infiltration, and took its form from the cavity, without communicating any to it — thus producing a kind of pseudo-morphous crystal. The cavity enlarges, towards the surface of the crystal, by successive step-like ridges parallel and continuous nearly all around it. These ridges are also parallel with the face of the crystal, and they indicate an interruption in the process of crystallization by some cause not easily explained. The sides of the cavity do not conform to any of the striæ of the crystal, but they are nearly parallel with the small rhombic replacements resting on the adjacent lateral angles of the prism which are occasionally seen on quartz crystals from other localities, *rhombifère* of Haüy. The annexed cut represents the appearance of the cavity, drawn in full size from a *cast* of it. The position is reversed, the face lettered F being the bottom of the cavity in the crystal, and corresponding with face F of the crystal. Mr. Alger wished to call the attention of other mineralogists to the subject, and desired them to search for other specimens that might throw more light upon it.*



Dr. Cabot announced the donation from Mr. Theodore Lyman of $20 for the department of Ornithology. The thanks of the Society were voted for the donation.

A Geological Map of England was presented by Mr. Bulfinch.

Dr. Burnett presented a specimen of Prairie Grass of unknown species, seven and a half feet high.

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* A cellular quartz has been found in the vicinity of Lancaster, Penn. and described by Dr. Atlee in the American Journal of Science, Vol. XXXV. p. 139. But here the cavities presented no anomalous character, but were obviously produced by calcareous spar, precisely like those from Herkimer County, New York.

Mr. Alger presented a specimen of Iridescent Anthracite Coal from the Lehigh mines, Pennsylvania.

Mr. Lemuel Shaw, Jr. was elected a member of the Society.

April 17, 1850.

The President in the Chair.

Present, twenty-eight members.

The President exhibited a number of American Crania, and pointed out resemblances between those of races quite distinct from each other in geographical position.

He compared a Mexican head of the primitive race with one of a North American Indian, showing as great a similarity between them as is usually seen between the crania of Indians of the same tribe. A cranium of one of the second of the Mexican races, the Toltec, was shown, in comparison with the crania of three Mound Indians and an Inca Peruvian, to resemble them all very closely, giving probability to the opinion that they were all originally of the same stock; the Mound Indians by migration having founded the Toltec race, and they in their turn the Incas. He also exhibited one of the elongated crania of the Peruvian race which preceded the Incas; also an Aztec cranium belonging to the race which followed the Toltecan in Mexico, remarkable for its antero-posterior compression, and a deep perpendicular depression behind, extending up over the vertex, dividing the head into two lateral lobes. A cranium of a Natchez Indian was shown to resemble this last very closely, particularly in the flattening from before backwards.

Dr. Gould presented descriptions of the following shells from the United States Exploring Expedition.

Cardita ventricosa. Testa solida, ventricosa, ovato-trigona vix obliqua, radiatim 18–20 costata, costis concentricè subnodosis, interstitiis angustis, epidermide fuliginoso, villoso induta; umbonibus submedianis, obtusis; intus alba; margine profundè crenulato; dente cardinali valvæ dextræ, elevato, crasso, triangulari. Lat. $\frac{3}{4}$; alt. $\frac{5}{8}$; lat. $\frac{1}{2}$ poll. *Hab.* Puget Sound.

Compared with *C. borealis*, Conr., it is thicker, less transverse, more tumid at the beaks, which are less recurved; the ribs are barred; the cardinal tooth is short, triangular (not long falcate) and detached from the margin; the crenulations of the margin deeper.

Cardita procera. Testa elevata, ovato-triangularis, radiatim ad 15-sulcata, (interstitiis convexiusculis) concentricè striata, epidermide fulvo induta; apice mediano, acuto, obliquo; cardo dente unico triangulari obliquo, instructus; margine interno sulcato. Long. $\frac{3}{5}$; alt. $\frac{3}{5}$; lat. $\frac{1}{5}$ poll. *Hab.* Rio Negro, Patagonia.

It has a more compressed and less oblique form than *C. borealis*, and fewer ribs. The right valve only was obtained.

Cardium blandum. Testa parva, tenuis, subcircularis, vix transversa, ventricosa, posticè subtruncata, cinereo-rufescens, costis planulatis radiantibus ad 40 insculpta, sulco angusto sejunctis, et liris concentricis tenuissimis, arcuatis, reflexis, decussatis: umbonibus medianis, tumidis, denudatis, eburneis: cavositas albida; margine interno crenulato; cardine debili. Long. 1; alt. $\frac{4}{5}$; lat. $\frac{3}{5}$ poll. *Hab.* Puget Sound.

I at first supposed this to be the young of *C. Californianum*, Conr., but find that there are about ten more ribs, and the sculpture is quite different. It seems to be the analogue of *C. Icelandicum*, which has acute ribs and a peculiar fringed epidermis. Its form varies from circular to transversely oval.

Cypricardia rosea. Testa transversa, oblonga, tenuis, anticè radiatim tenui-striata, posticè concentricè squamoso-striata: umbonibus valdè anticalibus, acutis; latere antico brevi, rapidè angustato, ad apicem truncato, albido; latere postico oblongo, ad apicem truncato, rosaceo; margine dorsali vix arcuato; margine ventrali recto: intus rosacea; cardo debilis, dentibus ferè longitudinalibus. Long. $1\frac{3}{4}$; alt. $\frac{3}{5}$; lat. $\frac{2}{5}$ poll. *Hab.* Feejee Islands.

Allied to *C. solenoides*, Reeve, which is much more elongated, has purplish rays, and is only tinted purple posteriorly, within. *C. coralliophaga*, Reeve, is somewhat more elongated, more laminated posteriorly, and radiate striate, and the edge only, tinted rose-red within.

ARTHEMIS LAMBATA. Testa tenuis, cordato-orbicularis, lenticularis, sordidè alba, radiatim tenuissimè striata et liris concinnis concentricis, posticè laminosis insculpta; natibus sub-medianis elevatis, acutis, anteversis; margine dorsali postico declivi, vix arcuato: lunula profunda, lanceolato-cordata: interior albida; sinu siphonali obliquâ, acutâ; cardine dentibus tribus divergentibus in utrâque valvâ. Long. 1; alt. $\frac{9}{10}$; lat. $\frac{1}{2}$ poll. *Hab.* Bay of Islands.

A. lincta is more elevated, has the ridges about twice as large, is destitute of radiating striæ, is more solid, and has the ligament margin excavated, and the siphonal sinus is narrower and more acute.

VENUS TOREUMA. Testa ventricosa, subglobosa, vix obliqua, straminea lituris angulatis rufis picta, concentricè porcata; liris numerosis ad lateros granulosis, acutis, crenulatis; interstitiis minutissimè striatis, et lineolis angulatis pallidis quasi indentatis; natibus sub-medianis, tumidis, obliquis; lunula profunda, latè cordata: intus pallida; margine crenulato: cardo validus; dente postico valvæ sinistræ longitudinali; dente antico biramoso. Long. $1\frac{3}{8}$; alt. $1\frac{1}{4}$; lat. $\frac{9}{10}$ poll. *Hab.* Mangsi.

In general characters it is allied to *V. verrucosa*, but is more orbicular, more tumid, and its sculpture far more delicate and elaborate, besides being beautifully ornamented with tent-like markings in the intercostal spaces.

VENUS CALCAREA. Testa ovato-rotundata, alba, crassa, inequilateralis, posticè subtruncata, striis concentricis, irregularibus, remotis, lamellosis signata; natibus acutis, attigentibus; lunulâ duplici, ovato-lanceolatâ; intus candidissima; margine crenulato. Long. $2\frac{1}{2}$; alt. 2; lat. $1\frac{2}{5}$ poll. *Hab.* New Zealand.

VENUS RIGIDA. Testa solida, transversa, ovato-ventricosa, inequilateralis, desuper visa acutè ovalis, sordidè alba, striis concentricis reflexis, utroque laminosis, et striis crassis radiantibus decussata; decussationibus anterioribus punctatis; umbonibus elevatis, anteversis, contiguis: lunula lata, vix circumscripta: latere antico angustato, rotundato; latere postico latè et obliquè truncato; margine dorsali rectiusculo; cardine dentibus in dextrâ valvâ duobus fissis, in valvâ sinistrâ dente unico fisso: intus porcellana; margine crenulato. Long. 2; alt. $1\frac{5}{8}$; lat. $1\frac{1}{5}$. *Hab.* Puget Sound; Straits of De Fuca.

Has the form and general aspect of *Saxidomus Nuttalli*, Conrad, in which the hinge teeth are quite different, and there are no traces of diverging lines. The sculpture is much finer than in *V. Dombeyana*, and more like that of *V. decussata*. It varies considerably in its size and proportions, being often much more expanded. One specimen measured in length $3\frac{3}{4}$; height $2\frac{3}{4}$; breadth $1\frac{1}{2}$.

ARCA SOBRIA. Testa transversa, inequilateralis, rhomboidea, alba, costulis numerosis radiantibus, posticis majoribus, rugosis, instructa, et undulis remotis concentricis subreticulata; latere antico angusto, rectangulari, in marginem ventralem posticè desinente; latere postico obliquè truncato, ad apicem acuto; umbonibus elevatis, angulatis; areâ cardinali angustâ lanceolatâ; cardo dentibus ad octo utrinque instructus. Long. $\frac{3}{4}$; alt. $\frac{9}{10}$; lat. $\frac{7}{10}$ poll. *Hab.* —— ?

It has the outline of *A. Deshaysii*, but is much smaller, more slender, more numerously ribbed, less acute posteriorly.

Dr. C. T. Jackson read an analysis of the new mineral Algerite, by Mr. Richard Crossley. It had been analyzed before by Mr. T. S. Hunt, and described by Mr. Francis Alger. For the analysis and description, see Boston Journal of Natural History, Vol. VI. p. 118.

The result of Mr. Crossley's examination was as follows: —

		Oxygen.	Ratio.
Silica,	52.00	27.01	7
Alumina,	25.42	11.88	3
Peroxide of Iron,	1.54	.47	
Magnesia,	5.39	2.08	1
Potash,	10.38	1.75	
Water,	5.27	4.68	1

This agrees very well with the following formula:—

$$3\ \dddot{Al}\ \dddot{Si}^2 + (\dot{Mg}\ \dot{K})^3\ \dddot{Si} + 3\ \dot{H}.)$$

Dr. C. T. Jackson read a description, with an analysis, of Asphaltum recently discovered in New Brunswick, as follows:—

On the 16th of last March, Henry W. Fuller, Esq. of Boston, sent me a box of specimens of a new kind of fuel recently discovered in New Brunswick. It was regarded as Cannel Coal of a peculiar kind.

This substance proved to be a very beautiful variety of Asphaltum. It is jet black, glossy, and free from smut. It breaks with a broad conchoidal fracture like obsidian, and presents a brilliant surface.

It is a little softer than rock salt, which scratches its surface. Its specific gravity is 1.107.

It softens and melts when exposed to heat in close vessels. When inflamed it does not run, but burns freely with a bright yellow flame and a little smoke. Heated in a glass flask, it gives off an abundance of bituminous liquid analogous to Petroleum, and leaves a very light and bulky coke of a brilliant black color and very porous. When exposed to heat in a covered platinum crucible, an abundance of carburetted hydrogen gas is given off, which burns with a large and brilliant yellow flame, having a high illuminating power.

The Asphaltum is but slightly acted upon by alcohol or by ether, yielding a little yellowish matter, which is obtained by evaporation of the solution. Oil of Turpentine dissolves a considerable quantity of the Asphaltum, forming a varnish such as is used by engravers.

Weighed portions of the Asphaltum were taken for analysis, and on being heated in a covered crucible so as to expel all the volatile matter, the coke remained and was weighed. The results of two trials gave,—

1st.	2nd.
58.5 of volatile matter	58.8 of volatile matter
41.5 of coke	41.2 of coke
100.0	100.0

The coke obtained was burnt on a platinum tray, placed in a red hot muffle, and left 0.47 per cent. of ashes, of a deep red brown color, consisting of peroxide of iron with a little oxide of manganese, and silica, and alumina.

The discovery of this valuable fuel so near to our borders is a matter of congratulation. The bed is stated to be four to six feet in thickness, and, if it holds out for any considerable extent, it must supply an enormous amount of fuel. This substance is particularly valuable for the production of gas for illumination. It is also the best fuel for steam engines, and is particularly well adapted for the use of locomotive steam engines on railroads.

I have not visited the spot where this Asphaltum is found, but, having seen it associated with gypsum from Dorchester, N. B., am led to believe that it occurs above the coal formation of New Brunswick.

Mr. Teschemacher exhibited some grains of platina from the washings on the Feather River, California, with the gold from which he had picked them out, several grains still remaining mixed therewith. He compared them with specimens, which he likewise exhibited from South America, and from Nischne Tagilsk, on the Ural Mountains; the grains from California appeared more to resemble those from South America — the Russian platina being less rounded and flattened by attrition. He thought the discovery was of some importance to the chemist and the manufacturer of acids, as it would afford another source of supply of this, to them, indispensable metal.

He also exhibited specimens of gold from various localities in California, from the finest grain to the large lumps. He observed that the large octohedrons of gold exhibited by Mr. Alger measured five sixteenths of an inch at the base of the pyramid. He had never seen crystals from other localities exceeding one sixteenth of an inch, and thought that this circumstance was an indication that the gold deposits in California were far larger than any hitherto explored.

Mr. T. also exhibited the *Osmium iridium* from the Ural Mountains.

Prof. Wyman exhibited some interesting fossils from the Mississippi Alluvium at Memphis, namely, a tooth of Megalonyx; a terminal phalanx of a young animal of the same species; the right half of the lower jaw of a Beaver; a portion of the lower jaw of *Castoroides Ohioensis,* and a young Mastodon tooth.

He pointed out the peculiarities of the claw and tooth of the Megalonyx. The claw much resembles that of the feline Carnivora, but is distinguished from it by the position of the tubercle at its base. In the Megalonyx, which is one of the Edentata, the tubercle is placed at the upper side of the base, operating to give a lever power to the muscles of extension; in the Carnivora the tubercle is at the lower side, giving a similar power to the muscles of flexion.

The tooth of the Megalonyx is not encrusted with enamel, has an elliptical crown, and a projecting ridge on the side which distinguishes it from all the other Edentata of this continent.

The fragment of the jaw of the Beaver did not materially differ from that of the existing species.

The fragment of the jaw of the Castoroides was interesting as belonging to the largest rodent known. A notice of the geological position of this species by James Hall, and a description of the cranium by Prof. Jeffries Wyman, were published in the Journal of this Society, Vol. V. p. 385. The fragment now exhibited belonged to a larger specimen than that from which the description was taken.

Dr. Durkee exhibited under the microscope specimens of *Polysiphonia formosa* and *Rhodomenia,* from New Brunswick; also a solution of gelatin derived from *Chondrus crispus.*

The President presented a number of the bones which had been missing from the anterior extremities of the Manatus presented by him to the Society some time since.

Mr. Belknap presented in behalf of Mr. George E. Tyler a specimen of Agama from the plains of Sacramento, California; an unknown animal from the Bay of San Francisco; and a Crawfish from the Isthmus of Panama. The thanks of the Society were voted for the donation.

Mr. Alger presented specimens of Sulphate of Strontium from Lockport; Dogtooth spar on Sulphate of Barytes; and Pyrites on Anthracite coal, from Little Lehigh River.

Dr. C. T. Jackson exhibited to the Society a number of curious artificial minerals, which were found crystallized in the slags of an iron furnace in Pennsylvania, by Charles Jackson, Jr., Esq. of Boston.

The forms of the crystals were rhombohedrons, hexahedral prisms, and right rhombic prisms. Some of them were transparent and colorless, resembling in appearance Chabasie, others resembled phosphate of lime, and sulphate of Baryta. These minerals will be analyzed by Dr. Jackson, who promised to make a future communication on the subject.

Dr. Moses W. Weld, and Messrs. Theodore Lyman, G. Howland Shaw, and Thomas Hollis were elected members of the Society.

Rev. Peter Lesly, of Milton, was elected a Corresponding member.

May 1, 1850.

ANNUAL MEETING.

C. T. Jackson, Vice-President, in the Chair.

Present, twenty-four members.

The several Curators, on being called upon, read their annual reports as follows.

The *Ornithological* department of this Society is in a good condition, free from insects, and improved since the last year by the substitution of many good in the place of bad specimens, by the addition of 179 specimens, and by the almost complete labelling of the Collection.

Donations have been received from Mr. Francis Gassett, Dr.

F. W. Cragin, Mr. F. J. Bumstead, Mr. Russell Sturgis, Mr. Theodore Lyman, Mr. Jellison, Mr. N. Robbins, and Mr. H. D. Morse; and specimens have been received from the Garden of Plants in exchange, and others have been purchased by the Courtis Fund.

The whole number of specimens in the Cabinet is 1,207.

The Curator of *Geology* reported, that there has been but little change in his department since the last annual meeting, when the whole number of specimens was stated to be about fifteen hundred.

Nevertheless, although the additions have been but few, they have been valuable. From the President several fine casts have been received as donations; one of the *Plesiosaurus dolichodeirus*, one of the cranium of a Mastodon, and some of the teeth and tympanic bone of the Zeuglodon.

From Mr. Desor, a fine series of fossil shells from the pleistocene deposits of Maine, Nantucket, and other localities. Also a specimen of a fossil Lingula from fossiliferous strata below the Potsdam Sandstone.

From Dr. J. V. C. Smith, some aggregated fossil shells from the Richmond tertiary.

The Curator of *Ichthyology* respectfully reported, that donations have been received within the year from Dr. Perkins at Cape Palmas; from Dr. S. Kneeland, of specimens collected at Pernambuco, and a specimen of *Salmo fontinalis*, from our waters; from Rev. Z. Thompson, of Burlington, Vt., a large specimen of his *Esox nobilior;* and from Benjamin Abrahams, Esq. a *Coryphæna globiceps.*

One specimen, among those sent by Dr. Perkins, represents a new form of the genus Polypterus; a description of it will appear in the next number of the Society's Journal. The Collection is in good condition.

The Curator of *Entomology* reported, that during the past year the Entomological cabinet has not been materially increased, Indeed, this was not an object as desirable at the present time as many others, and especially that of systematically arranging what is already in our possession, — towards the completion of which considerable labor has been bestowed.

The Curator of *Comparative Anatomy* reported, that during the past year his department had been carefully arranged, and most of the specimens legibly marked. Many valuable specimens have been added both by donation and purchase. The following have been added since the last report.

The nearly entire skeleton of the Manatus, from the President, one of the most valuable and interesting in the Society's collection (the only one in the country); the stuffed skin, also presented by the President; with numerous skeletons and crania, the addition of which to the collection has been announced from time to time.

A splendid skeleton of a male Moose, presented by Dr. Warren, has been beautifully mounted by Dr. Shurtleff in his best manner, and when finished will be the finest in the Cabinet, which owes so much to his skill and perseverance.

The principal donors to this department have been, the President, Drs. Perkins, Shurtleff, Plummer, Jackson, and Cabot: and Messrs. W. S. Bullard, Elliot Torrey, G. Howland Shaw ($20), R. B. Forbes, Jr., and Cols. Cushing and Jacques. Several skeletons are in active preparation.

The Curator of *Mineralogy* reported, that about one hundred specimens had been added to the collection during the year.

The Curator of *Herpetology* reported, that the department under his charge remained as last year.

The Librarian reported, that during the past year there have been added to the Library about five hundred volumes and sixty pamphlets.

Of these about three hundred volumes are the property of the Republican Institute, having been deposited with us by an agreement mutually beneficial to the two Associations.

The whole number of books in the Library, including those deposited, is about 3,500.

We have also one hundred volumes of Reports on the Natural History of Massachusetts, published by order of the Legislature, and left at our disposal.

The additions to the Library the past year have not been numerous, but we have the satisfaction of knowing, that in value they exceed probably those of any preceding year.

The Treasurer reported, that since closing his accounts, on the 1st of May, 1849, he had transferred the balance of "Building Fund" to "General Expense," and had carried to this latter account all the receipts and expenditures for building, making it stand thus: —

May 1st, 1849, balance of "General Expense,"		$297 13
" " " "Building Fund,"		368 42
April 30, 1850, paid General Expenses to date,		498 88
" " Building Expenses do.		4,161 76
		$5,326 19
I have received from Entrance Fees and Assessments,	620 00	
" Donations to "Building Fund,"	2,000 00	
" Stock in Atlas Bank sold	1,960 00	$4,580 00
Leaving a balance due him, April 30, 1850, of		$746 19

The income applicable to general expenses for the year that has just ended exceeds the current expenses chargeable to it by about $121 12.

The large balance now due to the Treasurer from this account has arisen from the cost of moving, putting on iron shutters, interest on a debt that is now paid in full, and other expenses which, from their nature, will not occur again. He would therefore recommend that this balance should be charged to the Courtis Fund, and be paid out of the balance to the credit of that account, namely, $983 38.

Messrs. Bulfinch and Sheafe were chosen a Committee to audit the Treasurer's accounts.

The report of the Treasurer and the suggestions therein contained, it was voted should be referred to the Finance Committee of the ensuing year.

The Committee appointed to nominate officers for the ensuing year reported the names of the gentlemen who held offices last year with the exception of those of Dr. A. A. Gould and Mr. P. T. Jackson, who declined a reëlection.

The candidates nominated were then voted for and elected, as follows: —

PRESIDENT,
John C. Warren.

VICE-PRESIDENTS,
Charles T. Jackson, D. Humphreys Storer.

CORRESPONDING SECRETARY,
J. Elliot Cabot.

TREASURER,
Nathaniel B. Shurtleff.

LIBRARIAN,
Charles K. Dillaway.

CABINET KEEPER,
Charles C. Sheafe.

CURATORS,

J. E. Teschemacher,	*Of Botany.*
Jeffries Wyman,	*Herpetology.*
Samuel Cabot, Jr.	*Ornithology.*
Thomas T. Bouvé,	*Geology.*
Francis Alger,	*Mineralogy.*
William O. Ayres,	*Ichthyology.*
Waldo I. Burnett,	*Entomology.*
William Reed,	*Conchology.*
Samuel Kneeland, Jr.	*Comparative Anatomy.*

RECORDING SECRETARY,
Samuel L. Abbot.

Mr. Bouvé addressed the Society in some appropriate remarks expressive of the universal sense of the obligation under which it had been placed by the valuable services of the two gentlemen, Dr. Gould and Mr. Jackson, the late Corresponding Secretary and Treasurer, who had declined a reëlection, concluding with the following resolution, which was passed unanimously: —

Voted, That the warm thanks of the Society be presented to Dr. Augustus A. Gould, our late Corresponding Secretary, and to Patrick T. Jackson, Esq. our late Treasurer, for the very able and satisfactory manner in which they have discharged their respective offices.

Mr. Bouvé introduced to the Society M. Vattemare, who made some statements with regard to the proposed interchange of specimens of Natural History, Books, &c. between the various Municipal Corporations, Scientific Societies, &c. of France and the Boston Society of Natural History. On behalf of the Museum of Natural History of Paris, he acknowledged the receipt of the Journal of the Society, and made liberal offers of donations in return. He proposed a similar reciprocity of gifts in behalf of the cities of Nantes and Bordeaux. He presented to the Society the printed Report of the New Hampshire Legislature on the subject of his visit to that State, containing directions for the preparation and preservation of objects of Natural History. He suggested that similar directions be prepared by the members of this Society, in the various departments, to be appended to a similar Report, which he thought would be published by the Legislature of Massachusetts at the next session, for general distribution. In this way very important knowledge would be disseminated, and very extensive collections of objects might be made. The thanks of the Society were voted to M. Vattemare for his donation.

Mr. Teschemacher said that it had been a question, how long the existence of gold in California had been known. It had been said that it had been known to the Spanish priests for a long time. He held in his hand a book, Phillips's Lectures on Mineralogy, printed in London in 1818, in which it was stated, that gold was found in large lumps deposited in the soil, a few inches from the surface, throughout an extensive district in California bordering on the sea. Thirty years ago, Mr. Ellis obtained from this region a mass of native gold mixed with quartz. In 1839, Mr. Alfred Robinson had sent to Boston from California, $10,000 worth of gold in large lumps.

Mr. Desor said that he had recently seen the vibrations of the water falling over the dam at Hadley, which had been of late the subject of discussion in another Society. The falling sheet was three or four feet thick, and the vibrations, to the number of one hundred and forty in a minute, were strongest in the middle and hardly perceptible at the sides of the dam, — a circumstance hardly to be looked for, if, as had been supposed, the vibrations were caused by the action of air confined beneath the sheet.

Mr. Briggs said he had observed similar vibrations at Lewiston, confined wholly to the middle of the sheet, where the water passed down an inclined plane with a sloping surface of thirty feet, the air having no opportunity to get beneath it.

Dr. Burnett described the appearance of Vermiculite under the microscope, after it has been exposed to the action of fire. He showed that the protruded portion was made up of transverse layers, consisting of three series of planes, one above the other, the lowest being based on a granular matter, and the upper two turning upon the joint at their base. The length of these plates diminished from the lowest to the highest, and their direction was towards the convex side of the curve formed by the Vermiculite.

Dr. Burnett also exhibited an Entozoön five and a half inches long, from a Cricket. It was one of the Gordiacea.

Mr. Desor spoke of an appearance which he had noticed on the surface of fresh water, for which as yet no very satisfactory reason had been given. The appearances in question are known in Switzerland by the name of "*fontaines*," springs, because they are supposed to indicate the presence of springs at those places. They consist of long bands of smooth water upon a surface otherwise ruffled. They have been thought to indicate a change of wind; but they are often oblique to it, even when it blows with violence. In Scandinavia, the fishermen attribute the phenomenon to a fatty substance on the surface, which they regard as the eggs of fishes. Mr. Desor had been informed by Admiral Duperrey, that he had observed the same phenomenon at sea among the Coral Islands of the Pacific. During the summer of 1849, he had himself seen it on Lake Superior. The smooth bands of water were observed running in many directions at the same time, when the surface was not much disturbed. There appeared to be more Infusoria in these places than elsewhere. There would seem to be good reason for supposing the cause to be the presence of an oily matter, perhaps from the decomposition of substances below. As a proof that they are not owing to the action of the wind, Mr. Desor mentioned that he saw them persisting during a strong surf; the large waves in those parts were smooth, whilst the general surface was wrinkled at large.

Prof. Wyman referred to a story, current in the newspapers, that there had recently been a shower of flesh and blood in Virginia. The substances in question fell in a field, and were distributed over a surface of twenty-five feet in extent. It was noticed by the observers that a cloud was passing over head at the time, and it was thought that a whirlwind might explain the occurrence. Dr. Johnson, of Richmond, in examining with the microscope the substances dropped, pronounced them fragments of fish. Specimens in Prof. Wyman's possession were in the form of shreds, the largest being about one ounce in weight. They resembled, he said, very much the contents of the stomachs of Turkey Buzzards, as he had examined them at Richmond, and he had no doubt this was the source from which they were derived. These birds are in the habit of gorging to excess, and frequently are so embarrassed in their movements by the quantity they have eaten as to be compelled to throw up from their crops a portion of food to lighten themselves. No mention, however, had been made of any of these birds having been flying over at the time the flesh fell; it was a circumstance that would hardly have attracted notice.

Dr. Gould said he had no doubt that Prof. Wyman's solution was correct. But he thought there was no question that solid substances, even living animals, were sometimes raised and transported to a considerable distance by whirlwinds. He mentioned that four years since a squid of a rare species was seen to fall on the Tremont road, near Boston, during a heavy thunder shower, and was brought to him, still living, by the gentleman who saw it fall. The specimen is in the cabinet of the Society.

Other similar instances were quoted by various gentlemen, such as the fall of small fishes, toads, &c.

Prof. Wyman remarked that there was nothing in the cloud passing during the "shower of flesh and blood" to make a whirlwind the probable source of it.

Mr. Abbot said that he thought bodies raised by whirlwinds might be carried to a considerable distance by clouds through the agency of electricity. Cumulus clouds were always highly charged with electricity. The particles of air in them would be mutually repulsive, and produce an expansion and consequent rarefaction to an indefinite extent, which enable the cloud to bear along the bodies taken up by whirlwinds.

Dr. Gould presented, in the name of Capt. Stribling of the United States Ship Ohio, a donation of gold sand from the Mormon diggings. The thanks of the Society were voted for the donation.

Dr. Kneeland presented, in the name of Mr. George Ditson, two Hindoo skulls. The thanks of the Society were voted for the donation.

Mr. Henry D. Morse was elected a member of the Society.

May 15, 1850.

C. T. Jackson, Vice-President, in the Chair.

Thirteen members present.

Dr. Burnett exhibited a living specimen of the Fire-fly, from Cuba, *Pyrophorus phosphorus*, and gave an acccount of its light-producing structure.

The luminous spots in this species are situated at the posterior angle of the thorax. By Spyx and Matteucci they have been described as made up of of a globular, phosphorescent matter. Dr. Burnett had dissected these spots immediately after the death of the animal, and had examined them under the microscope and by means of chemical reagents. The phosphorescent spot was found to be made up of fat globules permeated by tracheæ, and showing no trace of nerves or bloodvessels. It is difficult to say in what precise portion of this structure the phosphorescence is situated, as reagents which destroy one or the other extinguish the light. It is probable that the phenomenon is caused by the action of the air introduced through the tracheæ upon the fat, a slow combustion, as suggested by Matteucci. The light was found to continue two or three minutes after the death of the animal. Dr. Burnett said that his observations on this insect corresponded with his observations made several years since on the common Lampyris or Fire-fly.

Mr. Desor alluded to the fact that certain species of crabs are luminous. In these this property is probably due to the nervous system.

Mr. Desor called the attention of the Society to the subject of the Terraces of Lake Erie. He said that Mr. Lyell had declared that he could not determine whether these terraces were of fresh or salt water origin. With reference to this point, Mr. Desor read a letter from Mr. Charles Whittlesey of Cleaveland, Ohio, and another from Mr. J. A. Lapham of Milwaukie. Mr. Whittlesey writes, — "The blue marly clay of Lake Erie, is, I think, of the age of the Loess of the Rhine; for I have ten shells from it at this place, about fifteen feet above the Lake and a Planorbis and a Helicina, the same which I saw in the Loess of St. Louis, and of New Harmony, Indiana, in great abundance, the characteristic shells of the Loess of the Rhine."

Mr. Lapham also writes to Mr. Desor, that during an experience of twenty years as an engineer in Ohio and Wisconsin, he had never found true drift fossils in the drift deposits of the Western country. "Milwaukie is surrounded by hills composed entirely of drift from fifty to one hundred feet high, bordering a comparatively level plain, on which much of the city is built. The several streets cutting these hills have to be graded down, sometimes to the depth of thirty or forty feet, and I have examined all these deep cuts anxiously for fossils or other facts bearing on the subject, but no fossils were found. Once it was reported that, in grading Vliet Street, trunks of trees, horns of deer, &c. were found twelve feet below the surface; but this proved, on examination, to be the site of an ancient pond or marsh, now almost entirely filled. The materials in which the timber and horns were found were peat and marl, but not drift, although surrounded by true drift. Upon excavating a bluff near the Menomonee for the Milwaukie and Mississippi railroad, a bank of sand and gravel in quite regular layers was found *resting* against the bluff and filled with shells of species now living in our waters. This bank has evidently been formed by the gradual wearing down of the bluff where it formed the shore of the Lake, the material being spread out under water like the delta formed off the mouth of a large river in the ocean. The direction of the layers, parallel to the surface, is a significant fact. This delta rises gradually from the marsh to the foot of the bluff, where it attains an elevation of twenty-four feet above the present water level. It may then be considered as an established fact, that Lake Michigan, at no very remote period, (certainly far subsequent to the drift period,) stood at an elevation of at least twenty-four feet above its present surface. The difference in character of the light-colored materials of the delta and the very hard blue and red clay is quite obvious, and could not be confounded. There are other places where similar deltas are formed, but they have not been opened so as to show their geological character. I have no doubt the locality examined by you at Chicago belongs to the same era; for the banks there, being only from six to ten feet high, must have been entirely submerged."

Dr. C. T. Jackson remarked, that he had pointed out, in 1844 – 5, that Lake Superior was formerly at least twenty feet higher than the present level.

The following shells from the United States Exploring Expedition were described by Dr. Gould: —

CYCLAS EGREGIA. T. ventricosa, transversa, oblonga, subequilateralis, concentricè tenui-lirata; umbonibus parum elevatis, tumidis; epidermide viridi-corneo, fusco-zonato; plerumque *C. corneæ* similis. Long. $\frac{7}{8}$; alt. $\frac{6}{8}$; lat. $\frac{1}{2}$ poll. *Hab.* New South Wales?

It is larger, more rounded in outline, and more globose in form than *C. cornea.* The epidermis is less glistening, of a deeper green, and exhibits no traces of radiations. The ligament is shorter and more prominent. The beaks, hinge, and furrowing are nearly the same in both.

CYCLAS PATELLA. T. parva, tenuis, rotundato-ovalis, lenticularis, modicè cavata, concentricè exiliter sulcata, epidermide luteo-viridi induta; umbonibus medianis, rotundatis, haud elevatis: intus lactea: cardo dentibus duobus minutis cardinalibus instructus; dentibus lateralibus remotis, validis. Long. $\frac{1}{2}$; alt. $\frac{3}{8}$; lat. $\frac{1}{4}$ poll. *Hab.* Oregon.

This is to be compared with *C. cornea* on account of the peculiar rounded form of the dorsal region, the umbones not rising so as to interfere with the general outline. The cavity of the beaks is still more shallow, the sulcation coarser, and the color yellowish rather than green, and on the whole the shell is more dense and larger.

CYRENA DEBILIS. T. parva, tenuis, transversè ovata, posticè ampliata et subtruncata, sub-equilateralis, concentricè liris confertis, sub-reflexis arata, epidermide nitido, supernè olivaceo induta; umbonibus parum elevatis, erosis, absque lunulâ: intus violaceo-albida; dentibus cardinalibus inconspicuis, dentibus lateralibus elongatis, striatis. Long. $\frac{6}{10}$; alt. $\frac{4}{10}$; lat. $\frac{1}{4}$ poll. *Hab.* New Holland?

Most like *C. pusilla*, but has no areola in front of the beaks, is less orbicular, and somewhat larger. In general it resembles a Cyclas.

ANODON GLAUCA. T. transversa, elongato-ovata, ventricosa, anticè rotundata, posticè obliquè rotundato et costâ obliquâ submarginali munita; margine dorsali arcuato; margine ventrali concavo; umbonibus antemedianis, acutis, parum elevatis; epidermide olivaceo-glaucescente fluctuatim corrugato induta: cavositas argentea; disco salmonaceo: cardo edentulus vel potius papillâ cardinali in valvâ dextrâ instructus. Long. $1\frac{5}{8}$; alt. $\frac{7}{8}$; lat. $\frac{1}{2}$ poll. *Hab.* Peru.

The peculiar dead rusty-green color of the epidermis, with its loop-like corrugations may serve as distinctive marks. It would come under the genus Monocondylea of D'Orbigny.

ANODON FEMINALIS. T. solidula, transversa, ovato-triangularis, anticè acuminata, margine postico in margine dorsali continuo, arcuato; margine ventrali recto; apice rectangulari; umbonibus inconspicuis, erosis, anticis, declivitate posticali obtusè angulato; epidermide lamelloso, piceo: margarita purpurascens; limbo argenteo; dente cardinali obsoleto. Long. $2\frac{1}{4}$; alt. $1\frac{1}{4}$; lat. $\frac{3}{4}$ poll. *Hab.* Oregon.

At first this was supposed to be the young of *A. angulata*, Lea; but it proves different in several constant characters, besides its widely remote habitat. It is much smaller and thinner, its surface rude and dusky, instead of smooth and green; its outlines are all curves instead of right lines; the dorsal and terminal outlines form a continuous curve instead of a distinct angle; the beaks are more anterior and the cardinal apophysis is never found in *A. angulata*, while it is constant in this.

ANODON COGNATA. T. fragilis, transversa, oblongo-ovata; margine dorsali brevi, recto; margine ventrali arcuato; latere antico rotundato; latere postico obliquè truncato, ad apicem rotundato; disco turgido; epidermide virescente, nitido; umbonibus antemedianis inconspicuis, undulatis: margarita livido-albida. Long. 3; alt. 1½; lat. 1 poll. *Hab.* Nisqually and near Fort Vancouver.

Resembles small specimens of *A. cygnea;* but the dorsal margin is shorter, not continuously straight, and forming an abrupt angle above, anteriorly; the posterior extremity is less acute and more nasute; the cavity of the beaks is also somewhat over-arched. Excepting the beaks, it is like *A. fluviatilis.*

ALASMODON FALCATA. T. transversa, valdè inequilateralis, falcata, anticè rotundata, posticè deflecta, acuta marginibus subparallelis; disco sub-excavato; umbonibus obtusis, erosis; epidermide subfusco; dente cardinali in valvâ dextrâ elevato, trigono, in v. sinistrâ longitudinali, compresso-triangulari; margaritâ purpurascente; limbo argenteo. Long. 4; alt. 1½; lat. 1 poll. *Hab.* Wallawalla, Oregon; Sacramento River, California.

Mr. Lea and others have regarded this as a variety of *A. margaritifera;* but besides the uniformly peach-blossom nacre, the form is generally more arcuate, the exterior more waved, the color darker, the anterior tooth in the right valve is comparatively obsolete, longitudinally oblique and lamellar in the young.

UNIO FAMELICUS. T. parva, tenuis, transversa, oblongo-ovata, convexiuscula, epidermide fusco-castaneo induta; margine dorsali arcuato; margine ventrali rectiusculo; latere antico angusto; latere postico obliquè rotundato; umbonibus haud elevatis ad quadrantem anteriorem sitis; dente cardinali obliquo, compresso, valido; dente laterali brevi, recto: margarita subpurpurea. Long. 1¼: alt. ¾; lat. ⅜ poll. *Hab.* Wallawalla, Oregon.

A small and rather remarkable species, like a miniature *U.*

complanatus. It is more equilateral, has no dorsal angles, the dorsal and ventral margins diverge more, and the cardinal teeth are more oblique.

Unio lutulentus. T. transversa, compressa, sub-falcata, valdè inequilateralis, concentricè undulato-striata interdum nodosa vel sursum rugosa, fusco-virescens; lateribus rotundatis; marginibus sub-parallelis; umbonibus prominulis, erosis; dentibus cardinalibus obliquis, compressis, in valvâ dextrâ bifidis; dentibus lateralibus elongatis, compressis, rectis: margarita argentata; limbo anticè incrassato. Long. 2; alt. 1; lat. $\frac{2}{5}$ poll. *Hab.* New Zealand.

Resembles *U. monodon*, and slender specimens of *U. complanatus.* It is not a fragile shell, and the peculiar tubercular waves along its slope, the scattered corrugations on its disc, and its peculiar color, are its best diagnostic marks. These are usually concealed by a thick coat of black earth. It is said to come from streams in the vicinity of chalybeate springs.

Unio profugus. T. transversa, elongato-ovalis, ventricosa, epidermide fusco-castaneo, concentricè undato-striato, radiatim obsoletè plicato induta; margine ventrali vix arcuato; margine dorsali sub-recto; latere antico rotundato; latere postico obliquè truncato, ad apicem obtuso; umbonibus ante-medianis, elevatis, erosis; dentibus cardinalibus obliquis, elongatis, compressis; dentibus lateralibus remotis, sub-arcuatis: margarita livido-albida. Long. $2\frac{3}{4}$; lat. $\frac{7}{8}$; alt. $1\frac{1}{2}$ poll. *Hab.* Hunter's River, N. S. Wales.

Slender varieties have much the appearance of the more expanded forms of *U. lutulentus.* It is more tumid, the beaks more elevated and more central, the hinge more curved, the cardinal tooth of the right valve more oblique and distinctly bifid, the lateral tooth of the left valve less extensively cleft, and I cannot find that it is ever nodular along the posterior slope.

Unio verecundus. T. tenuis, inequilateralis, transversa, ovato-oblonga, convexiuscula, luteo-olivacea; margine dorsali recto; margine ventrali arcuato; latere antico rotundato; latere postico obliquè rotundato; natibus prominulis, acutis, undulatis, erosis: cardo exilis; dentibus tenuibus longitudinalibus: margarita salmonaceo-purpurea. Long. $1\frac{3}{4}$; alt. $1\frac{1}{8}$; lat. $\frac{5}{8}$ poll. *Hab.* Manila.

Much like *U. Bengalensis* and *U. foliaceus.* In the former, both ends of the ventral margin are angular, the posterior side is dilated and angular at tip, and the interior is less bright red. The form of this is rather elliptical than ovate. *U. foliaceus* is smaller, thinner, compressed, and has a plumbaginous nacre.

UNIO DORSUOSUS. T. transversa, retrorsum ampliata, inequilateralis, compressa, castanea; latere antico circulari; latere postico obliquè rotundato; margine dorsali recto; umbonibus pro-eminentibus, antrorsum concentricè costato-undulatis, retrorsum nodoso-fluctuatis: dente cardinali perobliquo, elongato, compresso; dente laterali recto: margarita ex albo-cœrulescens, livido ad umbones tincta. Long. $1\frac{1}{2}$; alt. $\frac{7}{8}$; lat. $\frac{1}{2}$ poll. *Hab.* Eastern Asia?

Allied to *U. Murchisonianus*, Lea; it is more widened posteriorly, more compressed, not sinuate beneath, thinner.

Dr. Burnett read a paper on Vibrios, the purport of which was to show that these organisms are plants and not animals, as they have been heretofore considered.

Dr. Burnett's observations were made with a powerful microscope, manufactured by Spencer, of Canastota, New York, which has never as yet been surpassed in power. With the aid of this instrument he had been able to watch the development of Vibrios, of the genus Spirillum. Hitherto, from their motion and the linear direction of the articulations of which they are made up, they have been regarded as animals. Dr. Burnett, however, had been able to detect branching forms, like those of Algæ, indicating their compound cell-plant structure. Ehrenberg supposed that the Vibrios multiply by fissuration of previously existing forms; but with his more powerful means of observation, Dr. Burnett had seen the pushing out of one cell from another with their gradual increase in size, and he was led to infer that their growth was like that of Torula, by putting forth buds. The different species of Vibrios seem to be only different stages of development of these Algæ.

As to the cause of motion in these organisms, which has been considered voluntary, Dr. Burnett had no new hypothesis to offer. Subjected to electricity and chemical reagents they were found to be affected precisely as the Spermatozoa, which were formerly considered as animals from possessing this power, an opinion not now entertained by the best observers. Electrical shocks, sufficiently strong to kill small animals, had no effect on their movements, whereas chemical reagents on coming in contact with their cell-structure soon caused them to cease. Regarded as plants, their occurrence is more readily explained in the situations in which they are usually found, namely, in liquids and infusions containing other Algæ, especially the Torula; upon the tartar of the teeth in company with various Algæ, and in the dejections from the alimentary canal. Finally, their revival, after many years of apparent death, is more in accordance with the view which regards them as plants rather than animals.

Prof. Wyman asked, if any member could give him any information as to the alleged poisoning power of toads. It is a common popular notion that they possess this power. He had himself noticed that when, in an excursion in search of objects of natural history, he had put frogs and toads together in his box, on reaching home he had found the former dead and the latter living. Could it be that the toads were the cause of their death? He had also observed that during the breeding season, in the spring, frogs and toads do not assemble in the same pond. On the other hand, toads have been swallowed with impunity by the insane. An instance had come under Prof. Wyman's notice of a crazy man's swallowing a toad, which was ejected from the stomach in half an hour without injury to the man or the reptile. It is often noticed that dogs, after biting a toad, foam profusely at the mouth, possibly from some irritating secretion being poured out on the surface of the skin.

Dr. C. T. Jackson read an account, with a chemical analysis of Tellurium ore, from the gold mine of Whitehall, Va. as follows:

Early in May, 1848, I discovered an ore of Tellurium among some specimens of native gold, given me by Mr. Knowles Taylor, of New York, the specimens having been brought by him from the Whitehall gold mines in Spottsylvania county, Virginia. I made an examination of the ore and proved the existence of Tellurium by means of blowpipe experiments, but I overlooked the existence of Bismuth, and supposed that the oxide absorbed by the cupel was oxide of lead. I announced the fact of the discovery of Tellurium in the Sixth Volume of the American Journal of Science, published in September, 1848. Since I had not a sufficiency of the ore for a regular analysis, I was obliged to wait until I could visit the mine, which I was enabled to do last spring. In the meanwhile Mr. Coleman Fisher, of Philadelphia, received a sample of the ore from the Assayer of the Mint, and discovered the presence of Bismuth in combination with the Tellurium, and we are indebted to him for a chemical analysis of a specimen of this ore, an account of which is published in the Seventh Volume of the American Journal of Science for March, 1849.

By my own researches I am able to confirm the fact of the existence of Bismuth in this ore as stated by Mr. Fisher, but I do not find so large a proportion of Selenium as is given in his analysis, and do find a considerable proportion of Sulphur, which is not given in his analysis. It is possible that there are mixtures of distinct minerals in the specimens from the mine, and if care was not used in selecting the specimen for analysis, variable results might be obtained by the same chemist. My specimen was all taken from a single nodule of the ore, so that we cannot suppose it to have been mixed with other ores of similar appearance.

Description of the ore. It occurs in foliated masses in nodules invested with yellow oxide of Bismuth in mica slate rocks of the gold mines. Also in the quartz beds and veins which contain gold, and associated with masses of native gold which are impressed by the edges of the laminæ of the Tellurium ore. It is readily split into thin laminæ like sulphuret of Molybdenum. It is flexible and not elastic ; sectile and not brittle. Color, between tin white and steel gray, resembling very much flexible foliated Graphite of Orange county, New York. Hardness, 1. Sp. gr. not determined. Lustre, brilliant metallic. Before the blowpipe, melts readily, giving off fumes of sulphurous acid gas and a slight odor of Selenium. In the glass tube, gives Sulphur and Telluric acid. The residue, after the sublimation of the Tellurium, melts, and is reduced upon charcoal to metallic globules. Cupelled, a minute globule of gold remains. By qualitative analysis on 1.5 grammes I obtained Sulphur, Bismuth, Tellurium, and traces of Selenium. I also found metallic gold mechanically mixed with the folia of Tellurium ore, and in very fine scales. Oxide of Iron and Silica were also obtained, which were mechanical mixtures. By a carefully conducted analysis of one gramme of the picked scales of Tellurium ore, I obtained the following results: —

		or per cent.
Bismuth,	0.5880	56.56
Tellurium,	0.3505	35.05
Sulphur,	0.0365	3.65
Gold, per Ox. Iron and Siliceous matter,	0.0270	2.70
	1.0020	

Which will give approximately the formula $Bi\ Te^2 + Bi\ S$.

The mineral, therefore, agrees closely with the Tetradymite of Schemnitz, Hungary, analyzed by Berzelius. It is a very rare mineral, never before discovered in the United States.

Dr. C. T. Jackson stated, that he had observed that Cochituate water dissolves lead and tin. In numerous specimens drawn from pipes in the city, he had always detected these minerals, the tin being supplied from the solder at the joints. He said he knew no way by which the community could be protected from the lead in the mains, large quantities of it sometimes getting into them at the joints, where it is used as packing.

Dr. Burnett presented an Actinoid Polyp attached to a bivalve shell, which had been drawn up from deep water in Boston harbor. Between the valves of the shell was found a Butter-fish, which was also presented to the Society.

The Curator of Ornithology announced the donation of a specimen of *Colymbus glacialis*, Great Northern Diver, from Mr. G. Howland Shaw; *Podiceps auritus*, Eared Grebe, female, from Mr. J. L. Tucker; *Ibis guarana*, Glossy Ibis, from the Harvard Natural History Society. A specimen of *Thalassidroma Leachii*, Leach's Petrel, shot on Chelsea Beach, had been purchased. The thanks of the Society were voted for the above donations.

The Curator of Herpetology announced the donation of a live Tortoise from Cape Haytien, in the name of J. P. Couthouy.

A mole was presented in the name of Mr. S. R. M. Holbrook, of Milton, Mass. The thanks of the Society were voted for the donation.

A bottle containing Insects, Spiders, &c. was presented in the name of Dr. F. W. Cragin, of Surinam, a corresponding member.

Mr. Stodder exhibited to the Society water pipes of various sizes, made of Gutta percha.

Drs. W. W. Codman, Buckminster Brown, and Mr. Thomas Ross were elected members of the Society.

June 5, 1850.

The President in the Chair.

The President introduced to the Society Rev. Zadock Thompson, of Burlington, Vt., who had been invited to deliver the annual Address.

Mr. Thompson proceeded to address the Society upon a subject for which he was peculiarly fitted, namely, the Natural History of Vermont. He gave a sketch of the most prominent physical features and the geological characteristics of the State, showing how they influenced the distribution of plants and animals. He stated numerous interesting facts in relation to the fishes and mammalia of Vermont. He gave an account of what had been done by the State government for the encouragement of science, by authorizing State reports on the various departments of Natural History. He spoke of the many difficulties by which the study of Natural History in country places is attended, and made some suggestions by which he thought they might be obviated. In conclusion, he set forth the attractiveness of the study, strongly advocating it as a means of refining and improving man's moral sensibilities, and sharpening and invigorating his intellectual powers.

At the close of the Address, on motion of Dr. Storer, it was unanimously voted, that the thanks of the Society be presented to Rev. Zadock Thompson for his interesting and instructive Address.

Prof. Agassiz next addressed the Society on the subject of the classification of some of the Mollusca, particularly those of the order Acephala. He showed that the genera Cyclas, Unio, and Anodon agree in the arrangement of the tentacles above and below the mouth, in the form of the foot, and the nature of the epidermis ; whereas other characters, which had been regarded as distinctive, such as the length of the syphon tubes, are fallacious. In the Unio a syphon tube exists, bringing it in close alliance with Cyclas, although it is so short as not to protrude beyond the shell. In Cyclas the young are developed one at a time, between the gills, and at the time of birth are one half the length of the parent. The first young are produced at the third year of the parent. The place in which the young are developed affords another point of analogy between Cyclas and Unio. Prof. Agassiz stated that he had found that the foot in Cyclas is extended by the introduction of a quantity of water into its interior.

Three living specimens of *Menobranchus maculatus*, brought from Lake Champlain by Rev. Zadock Thompson, were placed upon the table for the examination of the Society.

June 19, 1850.

Dr. Samuel Cabot, Jr. in the Chair.

Present, sixteen members.

Mr. Girard read some additional observations on the nomenclature and classification of the fishes of the genus Cottus.

Having had an opportunity of examining the Ichthyology of the Voyage of the Sulphur, lately added to the library of the Society, I have been able to satisfy myself of the perfect identity of the genus *Centridermichthys* of Sir John Richardson, and *Trachidermis* of Mr. Heckel, *Cottus asper* excluded, and to settle the doubts I had entertained respecting the difference of these two genera and the impropriety of placing *C. asper* in either one of them.

The genus *Centridermichthys*, therefore, must be given up, and its species included among *Trachidermis*, in which I also place *Cottus intermedius* of the Fauna of Japan.

The synonymy of the genus *Trachidermis* will stand, at the present time, as follows :

TRACHIDERMIS FASCIATUS Heck. Ann. Wien. Mus. II. 1837, p. 159, pl. 9, figs. 1 & 2. — Philippine Island ; — Heckel.

TRACHIDERMIS UNCINATUS Grd. — *Cottus uncinatus* TEMM. & SCHL. in *Sieb.* Faun. Japon. 1843, p. 38. — *Centridermichthys uncinatus* RICH. Rep. Ichth. of the China Seas and Japan, 1846. p. 216. — *Centridermichthys ansatus* RICH. Ichth. of the Voy. of the Sulphur, 1844, p. 74, Pl. 54, fig. 6 – 10. — China Seas ; — Richardson.

TRACHIDERMIS IMTERMEDIUS Grd. — *Cottus intermedius*, TEMM. & SCHL. in *Sieb.* Faun. Japon. 1843, p. 38. — RICH. Rep. Ichth. of the China Seas and Japan, 1846, p. 218. — Jesse Island ; — Siebold.

In order to avoid all possible misunderstanding with regard to *C. asper*, I cannot but make a new generic name. It has a closer affinity to Cottus proper than to any genera of the marine tribe (*Acanthocottus*, *Trachidermis*, *Podabrus.*) In retaining for it the name of *Centridermichthys*, its relationship would be mistaken, as we now have that name as a synonym among *Trachidermis.* Moreover, *C. asper* was never intended to be its true type.

For a long time I used in my notes the name of COTTOPSIS as most appropriate for that species, and I now introduce it in the nomenclature, and recommend it to the attention of Ichthyologists. The characters of this genus will be better understood if we bear in mind that the fresh water Cotti, as a tribe, differ from the marine species, as I have shown on a former occasion.* Now, it differs from Cottus proper by its teeth on the palatine bones, and the roughness of its skin; also by its larger size; — from *Trachidermis* by its smooth head, its first dorsal fin, and the shape of its mouth, which resemble the head, first dorsal fin, and mouth, of Cottus proper; — from *Acanthocottus* also by its smooth head, its first dorsal fin, and its mouth, and especially by the presence of teeth on the palatine bones, and a rough skin.

There is among these genera a strange combination of a few characters, which are found scattered here and there, and combined in such a manner that two out of three will be present in one place, and two others in another.

COTTOPSIS ASPER Grd. — *Cottus asper* RICH. Faun. Bor. Amer. III. 1836, add. pp. 295, 313, Pl. 95, fig. 1. — *Trachidermis Richardsoni* HECK. Ann. Wien. Mus. II. 1837, p. 162. *Centridermichthys asper* RICH. Ichth. of the Voy. of the Sulphur, 1844, p. 76. River Oregon; — Lewis & Clarke. (Richardson.)

The voyage of the Samarang has made us acquainted with another genus of this family, which shows still more how economical nature has been in the distribution of the generic characters.

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* See Proceedings, Vol. III. p. 183.

PODABRUS Richardson.

Contains but two species, as distinct from each other as Cottopsis is distinct from Cottus. Yet they have this common character of a smooth skin, as Acanthocottus and Cottus have, and teeth on the palatine bones, as is the case with Trachidermis and Cottopsis. On the other hand, Podabrus has slender ventral fins, being composed of two soft rays only, and a small spine, differing in this respect from all other Cottoids. Another peculiarity is the crescent-shaped caudal. The two species differ from each other widely by the shape of the head and mouth; and I should not be at all surprised if more species were found, which would induce their separation into two distinct genera, resting on a combination of characters at present unknown.

Podabrus comes nearest to the marine tribe; and this fact gives me much confidence in the track I have followed in the study of the fishes, as it takes into consideration the element in which they live, and their geographical distribution. This shows, moreover, that each family has to be divided into genera according to characters of a very different value in each. The same may be said of the species; we cannot start from a uniform principle to ascribe to each their limits.

Podabrus cottoides Rich. Ichth. of the Voy. Samarang, 1848, p. 13, Tab. i. fig. 1 – 6. — China Seas; — Richardson.

Podabrus centropomus Rich. Ichth. of the Voy. of the Samarang, 1848, p. 11, Tab. i. fig. Island of Quelpert; — Richardson.

If we now take a general view of the family of true Cottoids, we shall have on one side Acanthocottus, Trachidermis, and Podabrus, that is to say, all which are marine, and on the other, Cottus and Cottopsis, all inhabitants of the fresh waters.

The genus Acanthocottus, numerous in species, is found in the arctic and temperate zones of both hemispheres, the Pacific excepted.

The genera Trachidermis and Podabrus, smaller in size, are confined to the Pacific, in the temperate and warm zones.

The genus Cottus belongs to the temperate zone, some species extending as far north as the arctic circle, and as far south as the torrid zone.

Finally, the genus Cottopsis is limited to the River Oregon.

A note was read from Rev. Zadock Thompson, correcting a misstatement in reference to several species of Pike from Vermont, in the Proceedings of the Society, Vol. III. p. 164 and 173, as follows: —

From statements, which I have observed in the published Proceedings of this Society, I am disposed to think there may be some misapprehension with regard to two or three species of fishes of the Pike family. On page 164, Vol. III. of the Proceedings, it is stated that my *Esox nobilior* was supposed, by Dr. Richardson, to be identical with *E. lucius;* and the same statement is repeated on page 173. This, I think, is a mistake; and that it is Le Sueur's *E. estor*, and not *nobilior*, which is identical with Dr. Richardson's *E. lucius;* for the Doctor says expressly, that Le Sueur's original description of his *E. estor* applies exactly to his own *E. lucius* and not at all to his own *E. estor*. Now it appears plain to my mind that the fish, which Dr. Richardson supposed to be identical with the European species, *E. lucius*, was the same which Le Sueur originally described and named *estor*, and that it was, therefore, the *true E. estor*. The fish which Richardson described as the *estor* is, certainly, not the *estor* of Le Sueur, and if Le Sueur's *estor* is not identical with the *lucius* of Europe, which is, I believe, the general opinion of naturalists at present, then the name *estor* was preoccupied when applied by Richardson to another species, which Le Sueur had probably never seen. Richardson's *estor* may possibly be identical with my *nobilior*, although his description is not fully verified by the specimens have I examined.

It is, I think, very certain that the common pickerel of Lake Ontario and Lake Champlain and their tributaries, is the true *E. estor* of Le Sueur, and that the name *estor* is correctly applied to this fish by Dr. De Kay, Dr. Storer, and other American writers; but the vulgar names, Maskallonge, Maskinonge, &c. which scientific writers have applied to the *estor*, belong to the entirely distinct species, which I have called *E. nobilior;* and the experienced fishermen of Lake Champlain never apply the name of Maskallonge to any other fish, unless for the purpose of imposition. The Maskallonge is comparatively much rarer, grows to a much larger size, is a much better fish for the table, and is, therefore, more eagerly sought after than the *estor*, or common lake pickerel. The fishermen, well knowing all this, sometimes seek to procure a more ready sale and a higher price for their large pickerel, (*E. estor*,) by crying them in the market as Maskallonge, (*E. nobilior.*)

It is stated on page 173 of the Proceedings of the Boston Society of Natural History, that, "in the *E. estor*, there is a mark of scales on the anterior edge of the operculum." In the specimens of this species which I have examined, no such mark of scales exists. Such a mark of scales is usually found on the operculum of the *E. nobilior*, but is not constant in that species. Independent of colors, perhaps the most obvious mark by which the two species may be readily distinguished is this, — in the *E. estor* the whole cheek in front of the preoperculum is covered with scales, while in the *E. nobilior* the lower half of the cheek is entirely naked, or scaleless.

In connection with the same subject, Mr. Charles Girard made the following remarks:

After an examination of the pikes from different parts of the country, Prof. Agassiz and myself had found the Maskallonge differing widely from *Esox estor* Les. and that fish was provisionally described under the name of *E. lucioides*, when Rev. Z. Thompson brought us a specimen of his *E. nobilior*, which, after a careful comparison was shown to be identical with *E. lucioides*. This name of *E. lucioides* has been published in Mr. Herbert's *Frank Forester's Fish and Fishing of the United States*, &c. The drawings were made from the specimens of Prof. Agassiz's Cabinet. But in both plates of *E. estor* and *E. lucioides*, the names are misapplied; *E. estor* of that book is *E. lucioides*, and vice versâ *E. lucioides* is *E. estor*.

Now the name of *nobilior* having the priority, must be retained for the Maskallonge, and *E. lucioides* will be its synonyme.

Mr. Girard further stated that the fish described, page 164, under the name of *Percopsis pellucida*, from Lake Champlain and Winooski River, is identical with *Percopsis guttatus* Agass. from Lake Superior. The former being merely a younger specimen. The genus *Salmoperca* corresponds with *Percopsis.*

The Secretary read a letter, addressed to Dr. Durkee, dated, Wentworth, N. H., May 20, 1850, from Mr. I. S. Davis, describing a phenomenon which had come under his own observation in the winter of 1845, as follows: —

On the first Monday of December, 1845, I was passing from Piermont to Wentworth in my wagon, there being no snow when I left home. After proceeding about two and a half miles towards Wentworth, I noticed that the snow in the road was thickly scattered over with what I supposed were *oats;* but noticing that there was no track of any kind in the road before me, I said (audibly, I think,) how could oats be scattered here ? It cannot be, for no one has been along here since the snow fell. So strange was the appearance that I determined to ascertain, if I could, what it was. I stepped down from my wagon and took several in my hand which were lying *straight* on the snow ; but in three seconds after touching my warm hand, they coiled up into a ring, as worms do in summer when taken from the tree or bush. I took up several at different times to ascertain if they would all coil up, and the result was the same in each instance.

I found, on taking the worms into my hand, that they were *larger* than oats. They were about one inch and a quarter long, about one tenth of an inch in diameter in the middle, and tapering a little each way from the centre. The color was a brownish green. The worm was covered with an extremely short, fine hair, and had, I think, twelve legs.

The worms lay on the snow when I first observed them, about as thick as oats are sowed on a field, but the quantity diminished as I passed along. The snow was falling at the time, and in consequence covered up many of them. I observed some few scattered along over a space of at least five miles. After riding about one mile from where I first discovered the worms, I called on a gentleman, in whom every one who knows him, reposes the fullest confidence as a *man of truth*, and requested him to walk out and see the wonder. He took up some of the worms and said, "they are real *worms, and alive*, for they coil up in my hand." This gentleman's testimony you can have if you wish.

There were no trees near where I first saw the worms. The ground was frozen hard. The snow was about four inches deep. And as it was snowing at the time, they must have fallen there or got there about the time I discovered them, otherwise they would have been covered with the falling snow, for none of them could move until taken into my hand.

The first worms I saw were about half a mile from the mountain for which Piermont was named, at least forty miles from the White Mountains.

I have never known or heard of a similar phenomenon. We have, however, not unfrequently, by thousands, what we call *the snow-fly*. It is an extremely small black fly, which we never see except when there is considerable snow, and generally in February or March. So numerous are they that they really make the snow look as if coal dust had been scattered upon it.

The wind was *South* when I saw the worms.

Yours, with respect, J. S. Davis.

Dr. Burnett stated that he had often observed the snow-fly in great numbers during the month of February. They generally appear in the vicinity of trees and bushes, from which they had probably come forth. They are species of *Lepisma* and *Podura*. With regard to the worms mentioned in the letter, he said he knew of no species which hibernate. He thought from the description of the letter, that they might be the wire worm, which sometimes exists in immense numbers in the fields, doing fatal injury to the grass.

Dr. Durkee spoke of the *snow-fleas*, which he had frequently seen on the surface of snow. As to the fact of living creatures being dropped from the clouds, he mentioned having seen a small lizard drop from the eaves of a house during a shower, which he had reason to believe had fallen with the rain. He also said that he had often known earth worms to make their appearance in unusual places, under circumstances making it extremely probable that they had fallen in a similar manner.

The following shells from the United States Exploring Expedition were described by Dr. Gould: —

Avicula vidua. T. parva, tenuis, dolabriformis, vix obliqua, per-inequilateralis, mutica, nitens, ex viridi purpurascens, deinde nigra, albo obscurè rudiata: valva dextra planulata: valva sinistra convexa, ecaudata: auricula parva, triangularis; fissura parva, superficialis, edentata: margarita ex argenteo violacescens; limbo lato, nigro. Long. $1\frac{1}{4}$; alt. $\frac{3}{4}$; lat. $\frac{3}{10}$ poll. *Hab.* Feejee Islands.

In the early stages the color is grass green, then passing through dark purple to coal black. It is remarkable for the perfect flatness of one valve. Its destitution of hinge teeth brings it in Lamarck's genus *Meleagrina.*

Avicula nigra. Testa mutica, inequivalvis, ecaudata, edentula, fusca, antrorsum lobata; valva dextra convexiuscula, posticè integer, anticè profundè emarginata; auriculâ triangulari, crenulatâ: valva sinistra convexior, posticè profundè emarginata: margarita ex argenteo cœrulescens; limbo lato, fusco. Alt. 2; long. $1\frac{3}{4}$; lat. $\frac{1}{2}$ poll. Dredged at Singapore.

More like *A. margaritifera* in form than any other, but is less retuse, destitute of scales, and having its substance a plain purplish black. It belongs to the section *Meleagrina.*

Avicula maculata. Testa solidula, ventricosa, per-inequilateralis, obliquè rotundata, ecaudata; margine caudali parum producto; extus calcarea, nigro radiata: auricula triangularis, crenulata; fissurâ profundâ: margarita pallidè aurea; limbo calcareo lato, vitreo, albo et nigro radiato: margo cardinalis latus, incrassatus; dente cardinali papilliformi; dente laterali brevi, posticè incrassato et deflecto, in valvâ dextrâ bifurcato; cicatrice musculari reniformi, profundo. Long. $1\frac{3}{4}$; alt. $1\frac{3}{4}$; lat. $\frac{5}{8}$ poll. *Hab.* Tutuilla, Samoa Islands.

The peculiar magnesian external coating, radiated with dark purple, the golden nacre, and the porcelain-like marbled limbus, make this a strongly marked species.

Avicula fucata. T. saccata, retrorsum obliqua, per-inequivalvis, scabra, rosaceo et flavido radiatim picta: auricula prægrandis, elongata; fissurâ byssali profundâ: valva dextra convexiuscula; angulo postico acuto: valva sinistra ventricosa, anticè integra, acutangularis, plicâ magnâ munita: cardo dentibus conspicuis: margarita argentea, violacescens; limbo corticali cretaceo, croceo et rosaceo radiato. Long. 2; alt. $2\frac{1}{4}$; lat. $\frac{7}{8}$. *Hab.* Feejee Islands. ?

A small species, colored much like *A. margaritifera;* but the wing curves in the opposite direction, and it is provided with a well-developed auricle, characters which could not be ascribed simply to immaturity.

Avicula lurida. T. squamosa, vix obliqua, ferè ecaudata, solidula, coloribus rosaceis, viridibus et flavidis radiatim fucata: valva dextra posticè vix sinuata, convexa; auricula lata, triangularis; fissura byssica haud profunda: valva sinistra ventricosa, tuberculo magno subcaudali munita, posticè integra: margarita argentea; limbo corticali corneo et nigro marmorato. Long. $2\frac{1}{2}$; alt. $2\frac{1}{4}$; lat. $\frac{3}{4}$ poll. *Hab.* New Zealand.

In form it resembles *A. fucata;* but its smoother surface, difference of coloration both without and within, and its much more elongated auricle, are quite distinctive. The young stages of this shell are exceedingly beautiful, being rose red, with a sort of superficial radiation of cream-color.

Auricula glabra. T. tenuis, semi-elliptica, vix obliqua, latè caudata, glabra, ad peripheriam lamellata, virescens, albo-radiata: valva dextra planiuscula; auricula latior quam longa: valva sinistra ventricosa, anticè integra, acutangula: cardinis dentibus obsoletis: margarita argentea; limbo corticali livido-corneo. Long. $2\frac{3}{4}$; alt. $2\frac{3}{4}$; lat. $\frac{7}{8}$ poll. *Hab.* New Zealand.

Outline much as in *A. fucata*, but the caudal region is much more compressed. Its smooth surface and widely different coloration are easily recognized. The white radiations are opaque, and have a superficial appearance.

Crenatula pergaminea. T. membranacea, obliquissima, subfalcata, concentricè laminoso-fibrosa, albida, lineis lacteis radiata; margine dorsali recto, umbonibus tumidis, acutis, ad trientem anteriorem sitis; latere antico arcuato et cum margine ventrali continuo; latere postico obliquè truncato; areâ cardinali angusta ad 5-crenata: intus sub-margaritacea. Long. $1\frac{1}{4}$; alt. $\frac{5}{8}$; lat. $\frac{3}{8}$ poll. *Hab.* Feejee Islands.

None of the species already described agree with this in color, texture, or form. Its structure is very delicate and unresisting, almost fibrous at its edge.

PERNA ARGILLACEA. T. solidula, mutica, compressa, elongata, anticè dilatata, posticè subrecta, ex luteo alutacea, hic illic nigricans; apice adunco: fissura byssali angusta, lanceolata: intus livescens: area cardinalis curta, obliqua, triangularis, sulcis obliquis ad 8 arata: fovea apicalis profunda. Long. $2\frac{1}{2}$; alt. 3; lat. $\frac{3}{8}$ poll. *Hab.* ?

The resemblance to the common *P. ephippium* of the West Indies is very great. It differs chiefly in the clay-colored exterior, and in having the byssal instead of the opposite side dilated; the muscular scar is also smaller.

PERNA TORVA. T. rudis, crassa, inequivalvis, concentricè lamellata, cinerea, obliqua, trapezoidea; latere byssali dilatato, semicirculari; sinu byssali profundo; apice adunco; latere postico rectilineari, obliquo, producto; margine cardinali obliquo: area cardinalis triangularis, sulcis obliquis ad sex arata: margarita ex argenteo-purpurascens; limbo lato, retrò dilatato. Long. $1\frac{1}{2}$; alt. $1\frac{3}{4}$; lat. $\frac{3}{8}$ poll. *Hab.* Sandwich Islands.

The obliquity of this species and the small number of its cardinal sulci are among its most prominent characters.

PERNA EREMITA. T. fragilis, exaluminata, variabilis, dolabrata, vulsellata, unguiformis, pectiniformis et omnimodè distorta, plerumque radiatim rugoso-striata et in junioribus rufolineata; antrorsum plus minusve curvata: margarita argentea; limbo corticali ampliato, foliaceo, stramineo, vitreo: margine cardinali ferè horizontali, 6 – 8 sulcato; fissurâ byssali profundâ. Long. 2; alt. $1\frac{9}{10}$; lat. $\frac{3}{8}$ poll. Inhabits Carlshoff Island, Paumotu Group.

This shell, though so variable as to elude all terms of description, is still very distinct from all others, in all its forms. It seems to acquire its multiform shapes from the cavities in coral where it resides. Young or well protected specimens are sculptured by delicate radiating ramose ribs bearing minute scales.

Perna nana. T. parva, crassa, subquadrata, adunca, lamellosa, extus nigra; margine ventrali sinuato; angulo infero-posteriori rotundato; latere postico sinuato: area cardinali lata, 6-sulcata; fissura byssali ampla, trigonalis: margarita plumbaginea; limbo corticali angusto, pallido. Long. $\frac{3}{5}$; alt. $\frac{3}{4}$; lat. $\frac{1}{4}$ poll. *Hab.* Feejee Islands; under stones. *Drayton.*

The solidity and color of this little species will not admit of its being confounded with any other species. It bears the marks of mature age.

Pinna senticosa. T. cuneata, sub-inflata, posticè obliquè rotundata, purpureo-nigricans; margine dorsali sub-ascendente; margine ventrali propè apicem pendulo: area triangularis superior costulis ad 7 radiantibus squamigeris (squamis semi-tubulosis) instructa; area inferior striis incrementalibus solum notata. Long. $4\frac{1}{2}$; alt. $2\frac{1}{2}$; lat. 1 poll. *Hab.* New Zealand.

Its general appearance is that of *P. seminuda;* but it is smaller, much darker, the ventral margin is less arcuated, and the scales much less numerous and regular.

Mr. Ayres made some statements tending to show that his species *Cottus variabilis* is distinct from *C. Grœnlandicus*, of which Mr. Girard has regarded it as the young.

C. Grœnlandicus, he said, is a northern species; south of Cape Cod it is very rare, and had never been seen in Long Island Sound, whereas *C. variabilis* is the only species of Cottus found in Long Island Sound. It is seldom more than six inches long, whereas *C. Grœnlandicus* is much larger. The under surface of *C. Grœnlandicus* has a number of circular, white spots, which Mr. Ayres had never seen in *variabilis.* In *Grœnlandicus*, the head is one third larger in proportion to the body, whereas, if *variabilis* were the young of this species the head should be proportionally larger than in the adult. In *variabilis* also the pyloric cæca are much shorter than in *Grœnlandicus.*

Mr. Girard replied, that he had remarked that he thought two species had been confounded under *C. Grœnlandicus*, and he should be pleased to find one of them to be that described by Mr. Ayres as *C. variabilis.*

Dr. Burnett announced that he had recently discovered in a human spleen a large number of crystals of the phosphate of magnesia and ammonia. He had also noticed in the blood corpuscles of the spleen crystals of hæmatin, an interesting fact when taken in connection with Dr. Ravenel's recent observations upon the cartilage corpuscles. Kölliker had recently announced the existence of such crystals in fishes and some warm blooded animals, but not in man. Dr. Burnett had not seen his statement at the time he made his observations.

Dr. Cabot read some observations upon the recent appearance in New England of *Ibis guarauna.*

Ibis guarauna has been confounded with *I. falcinellus* by many naturalists, among others even by Nuttall, Buonaparte, and Audubon. Lately our newspapers have contained several notices of some specimens of the Glossy Ibis which have been procured in different parts of this State, with various theories to account for their appearance in this part of the world, (such as, that they had passed round by Bhering's Straits, &c.) all of which are absurd for several reasons: 1st. The bird is not the same as that found in the old world; it is larger. 2nd. The *I. falcinellus* is as rare in the north of Europe as *I. guarauna* is here. 3d. Since the bird feeds on living animals and plants, it could not subsist on its voyage through the arctic regions at the early season at which it must have passed; it could much more easily have come straight across the ocean. 4th. We have a much more easy way of accounting for their appearance, namely, the *I. guarauna* (the bird which has been mistaken for *I. falcinellus*) is found in immense flocks in Mexico and in considerable numbers in Texas and Florida, where it breeds; so that, to account for their appearance here we have only to suppose that a few wandered a couple of days' journey farther north than usual, as we know to have been the case occasionally with other southern birds, as the Martinico and Florida Gallinules, White Egret, Pelican, &c. During the present month, four specimens of the *I. guarauna* have been procured in the New England States, three of them in Massachusetts, of which one was shot by Mr. F. Brown on the Fresh Pond marshes, and by him presented to the Harvard Natural History Society, who with great liberality presented it to us. The other two are in the possession of Mr. Jenks, of Middleboro', where they were shot. One was procured in Middletown, Ct. and is in the possession of Dr. J. Barrett of that place. Nuttall says, that they are occasionally exposed for sale in Boston markets; probably at the time when he made this observation there had been a flight of them into this State, similar to what has occurred this year; for during the past eighteen years (with the exception of three) Dr. Cabot had kept a very close watch upon our markets, with the express purpose of procuring birds for his own and the Society's collection, and during that time he had never seen a single specimen of this bird.

Mr. Briggs exhibited a specimen of pig iron crystallized in the form of geodes in the run of the metal, taken from an iron furnace in New Jersey. It presented an unusual appearance, and was much larger than any similar specimen he had seen before.

A letter was read from the President, announcing that he had procured, through the American Minister at the Court of Great Britain, a donation from the Royal East India Company of a complete suite of casts of fossils from the Himalaya mountains. Accompanying it were letters, announcing the gift, from Hon. Abbot Lawrence and the Secretary of the East India Company.

On motion of Mr. Durkee, it was

Voted, That the sincere thanks of the Boston Society of Natural History be presented to the East India Company for their extremely interesting and valuable donation. Also

Voted, That the thanks of the Boston Society of Natural History be presented to the Hon. Abbot Lawrence for his good offices in aiding the President in procuring for the Society the valuable donation from the East India Company.

And it was ordered that these votes be communicated by the Corresponding Secretary to the parties concerned.

Mr. Girard presented in behalf of Rev. Zadock Thompson, specimens of *Lucio-perca Canadensis* and *Americana.*

At the request of the Secretary, on motion of Mr. Sheafe, it was

Voted, That the Secretary be authorized in his private capacity to furnish reports of the Society's meetings for the Boston Traveller, and that no other newspaper be allowed to have a reporter at the meetings until otherwise ordered.

BOOKS RECEIVED DURING THE QUARTER ENDING JUNE 30.

Proceedings of the Academy of Natural Sciences of Philadelphia. pp. 245 – 270, and Index of Vol. IV. Also pp. 1 – 19, Vol. V. 8vo. Pamph. Philadelphia. *From the Academy of Natural Sciences.*

Proceedings of the American Philosophical Society of Philadelphia. No. 44. pp. 105 – 139. October, 1849, to March, 1850. *From the American Philosophical Society.*

Memoires du Muséum d'Histoire Naturelle. Tomes V. VI. VII. VIII. XIX. XX. 4to. London, 1819 – 1822. *Exchange with M. Vattemare.*

International Exchange. Address of M. Alexandre Vattemare. 8vo. Pamph. Concord, 1849. *From the Author.*

Contributions to Conchology, Nos. 1 to 6. By C. B. Adams. 8vo. Amherst, Mass. 1849 – 50. *From the Author.*

Monograph of Stoastoma. By C. B. Adams, A. M. 4to. Pamph. Amherst, Mass. 1849. *From the Author.*

Monograph of Vitrinella. By C. B. Adams, A. M. 4to. Pamph. Amherst, Mass. 1850. *From the Author.*

Archives du Muséum d'Histoire Naturelle. Vols. 1, 2, 3. 4to. Paris, 1839 – 43. *Muséum d'Histoire Naturelle.*

Silliman's American Journal of Science and Arts. No. 27. For May, 1850. *Exchange.*

Report of Select Committee on Publications of Natural History of New York. 8vo. Pamph. Albany, 1850.

Third Annual Report of Regents of the University of the Condition of the State Cabinet of Natural History, &c. 8vo. Pamph. Albany, 1850.

Memoires de la Société de Physique et d'Histoire Naturelle de Genéve. Tome XII. Première Partie. 4to. Genéve. 1849. *Société Physique*, &c.

Index Molluscorum Littora Scandinaviæ occidentalia habitantium. Faunæ Prodromum offert S. Lovèn. Holmiæ. 1846. 8vo. Pamph. *From the Author.*

Bulletin de la Société Géologique de France. Deuxième série. Tome VI. Feuilles 38 – 43 (18 June, 1849) et 1 – 3 (3 Novembre – 17 Decembre, 1849.) *Société Géologique.*

Geographical Memoirs of Upper California. By J. C. Fremont. 8vo. Pamph. 1849. Washington. Also Map of the same. *From Hon. R. C. Winthrop.*

Memoir of a Tour to Northern Mexico. By A. Wisligenus. 8vo. Pamph. Washington. 1849. *From Hon. R. C. Winthrop.*

Proceedings of Academy of Natural Sciences of Philadelphia. Vol. V. No. 2. pp. 21 – 52. 8vo. *Academy of Natural Sciences.*

Received from the Courtis Fund.

History of British Mollusca and their Shells. By Edward Forbes and S. Hanley. Nos. 1 – 28. 8vo. London. 1848 – 9.

Annals and Magazine of Natural History. No. XXVIII. for April, 1850. London.

Annals and Magazine of Natural History. No. XXIX. for May, 1850. London.

History of British Mollusca and their Shells. Parts 15, 16, 26, 27, 28. 8vo. London. 1849 – 50.

Reports and Papers on Botany. Edited by Arthur Henfrey. 8vo. London, 1849. (Ray Society's Publications.)

Natural History of British Entomostraca. By W. Baird, F. L. S. 8vo. London, 1850. (Ray Society's Publications.)

Deposited by the Republican Institution.

Monographie des Plantes Fossiles du Grès Bigarré de la Chaine des Vosges, par W. P. Schimper. 4to. Leipzig. 1844.

Annales de la Société Entomologique de France. Deuxième série, Tome VII. Paris, 1849. 8vo. Pamph.

Voyage autour du Monde. Par L. de Freycinet. Zoölogie par M. M. Quoy et Gaimard. 2 Parts. 4to. Paris, 1824. With folio plates.

Voyage autour du Monde par les Mers de l'Inde et de Chine, executé sur la Corvette d'État, La Favorite. 1830–2. Histoire Naturelle. 8vo.

Monographie Heliceorum viventium. Auctore L. Pfeiffer. Fasciculus 1–7. 8vo. Leipsiæ. 1847–8.

Library of American Biography. By Jared Sparks. 15 vols. 12mo. Boston, 1844.

Cyclopædia of English Literature. 2 vols. 8vo. Edinburgh. Edited by Robert Chambers, 1844.

Say's Treatise on Political Economy. 2 vols. 8vo. Boston, 1821.

Carlyle's French Revolution. 2 vols. 12mo. New York, 1847.

Guizot's History of Civilization. 3 vols. 12mo. London, 1846.

Guizot's History of English Revolution of 1640. 12mo. London. 1846.

Memoirs of Slater, and History of Cotton Manufacture. By G. S. White. 8vo. Philadelphia, 1836.

Wayland's Elements of Political Economy. 8vo. New York, 1837.

Renwick's Elements of Mechanics. 8vo. Philadelphia, 1832.

Byron's Life and Works. 2 vols. 8vo. London, 1846.

Tocqueville's Democracy in America. 2 Parts. 8vo. New York, 1839–40.

Ramsay's History of American Revolution. 8vo. Dublin, 1795.

Adams's Roman Antiquities. 8vo. New York, 1837.

Grahame's History of the United States. 2 vols. 8vo. London, 1827.

Napoleon and his Marshals. 2 vols. 12mo. Philadelphia, 1848.

Gibbon's Decline and Fall of the Roman Empire. 8vo. London, 1840.

Robertson's History of America. 3 vols. 8vo. London, 1792.

Synopsis Plantarum Fossilium. Auctore Fr. Unger. 12mo. Leipsiæ, 1845.

Synopsis Floræ Germanicæ et Helvetiæ, Auctore D. Guil. Dan. Jos. Koch. Parts 1, 2, 3. Leipsiæ, 1843 – 45. 8vo.

Die Wirbelthiere Europas. Von A. Graf Keyserling und Professor J. H. Blasius. Braunschweig, 1840. 8vo.

Naumann's Naturgeschichte der Vögel Deutschlands. 12 vols. 8vo. Leipsiæ. 1820.

Novorum Actorum Academiæ Cæsariæ Leopoldino-Carolinæ Naturæ curiosorum Voluminis Undevicesimi Pars Posterior. 4to. Vratislaviæ et Bonnæ, 1842.

Aussereuropäische Zweiflugelige Insecten; von C. R. W. Wiedemann. Hamm. 1830. 2 vols. 8vo.

Die Schmetterlinge von Europa; von Ochsenheimer und Treitschke. Leipzig. 1807 – 35. 10 vols. (17 parts) 8vo.

Annalen der Physik und Chemie. Von J. C. Poggendorff. Nos. 1 – 12. Band. 75 – 6. 8vo. Leipzig, 1848 – 9.

Neues Jahrbuch für Mineralogie, Geognosie, Geologie, und Petrefaktenkunde. Von Dr. K. C. Leonhard und Dr. H. G. Bronn. Heft. 1, 5, 6, 7. Stuttgart. 1848 – 9.

Martin's Introduction to History of Mammiferous Animals, &c. 8vo. London. 1841.

Memoirs of the Geological Survey of Great Britain. 3 vols. 8vo. London, 1846.

July 3, 1850.

Dr. Charles T. Jackson in the Chair.

Present, fifteen members.

As the Secretary would be absent for some months, Dr. S. Kneeland, Jr. was chosen Secretary, *pro tem.*

Dr. C. T. Jackson explained a specimen from a vein of Iron Ore, on the banks of the Alleghany River, in Pennsylvania, presented to the Society by J. W. Hall, Esq.

It was an argillaceous carbonate of iron, which had assumed pseudomorphous crystalline forms, which, with the cracks produced by desiccation, gave it very much the appearance of a fossil jaw and teeth. It probably contained about thirty per cent. of iron.

Dr. Burnett made some remarks on *Naviculæ*.

About these, the opinion of naturalists has been frequently changed; they have sometimes been considered as plants, at others as animals. Having recently carefully studied the *Naviculæ* with a powerful Spencer Microscope, he said that they were unquestionably animals. In judging of the animal or vegetable nature of the *Infusoria*, many points once supposed distinctive are now known to be common to both animals and vegetables. For instance, adaptive motion is not proof that the object is an animal; it has been recognized in plants known to be such by chemical composition; neither is the mode of reproduction distinctive. The point is principally to be decided by their anatomical structure. The siliceous shells of *Naviculæ*, though having some marking of vegetable cells, yet possess certain striæ and marks which are not vegetable. His specimens were obtained from the internal surface of intestinal worms found in the rock cod; they were $\frac{1}{600}$ of an inch in length, and $\frac{1}{2000}$ of an inch in width. These animals have been divided into two classes, the ribbed and the ribless; his specimens were of the latter class. He was able to trace an opening at the top, or a mouth, like the sucker of a leech, by which they were found hanging to the internal surface of the intestinal worms; he could also trace an œsophagus, stomach, and anus. He is sustained in his opinion by the structure of *Planariæ*. Whatever may be said of other *Naviculæ*, we may justly consider this species an animal parasite.

Dr. C. T. Jackson inquired if any animals secreted siliceous matters; he supposed this to be characteristic of vegetables.

Dr. Pickering observed that he believed the Cypris, a minute crustacean with a kind of bivalve shell, secreted siliceous matter; at any rate they were so hard as to scratch glass, and it was difficult to examine them under the microscope without great care.

Dr. Burnett gave an account of some observations which he had made on the atmospheric dissemination of algous plants.

The occurrence of minute Algæ and Spores in liquids and infusions, under circumstances rendering improbable their introduction from without, is frequently noticed by the microscopical observer.

While making experiments upon Diabetic Urine, (the abundant presence in which of the common ferment Alga, *Torula cerevisiæ* is well known,) he was surprised to find all the common liquids in its neighborhood pervaded by this same Alga, and particularly those exhibiting any tendency to decomposition. This led him to think that the dissemination of this minute plant took place by the medium of the atmosphere, which was full of its spores.

Experiments with *air tight* and *partially covered* vessels of liquid, placed near the original source, showed this to be true. And even for several weeks after, the atmosphere of the room seemed to retain many of the spores; for liquids placed as before soon contained many of the plants.

He stated this fact on account of the too great importance often attached to the presence of fungi and algæ in various localities, and especially as being *the cause* of various coincident phenomena; whereas, their presence may, in many cases, be considered accidental.

Dr. C. T. Jackson alluded to experiments of passing the air containing these fungi through concentrated sulphuric acid. No infusoria were found in vessels to which air could only gain admittance to a vegetable infusion through this medium, while they were abundantly found in infusions to which air had free access. These results confirmed the statements of Dr. Burnett.

Mr. Alger alluded to the sudden disappearance of young ducks in ponds. A friend of his who had several about a week old, was surprised to see some of them suddenly pulled under water. He discovered that they had been seized by Snapping Turtles, (*Emysaurus serpentina.*) It is a common belief that Bull Frogs are guilty of the same misdeeds.

At the request of Mr. Alger, Dr. C. T. Jackson gave a description of the red oxide of Zinc and Franklinite found in large beds in Sussex, Sterling, and Franklin, N. J.; to which localities they had recently made a visit.

This mineral will be valuable for many purposes; but principally for the manufacture of the white oxide, or zinc white, which may be so advantageously substituted for white lead as a paint, thus protecting workmen from the well known poisoning of the system caused by the latter. This has till lately been imported, but now an inexhaustible supply has been found at home. This mineral consists of oxide of iron, manganese, and oxide of zinc.

The advantages of this as a paint over white lead, in addition to the security of the workmen from disease, are, that the action of gases will not change it, while lead paint is turned black by sulphuretted hydrogen; it is perfectly white, and gives to a surface the lustre of porcelain. The Astor House in New York, and Mr. Alger's house in this city, are painted with Zinc white. It is ground in spirits of turpentine, and mixed with varnish to give it consistence.

Franklinite alone makes an excellent grayish-brown paint, very permanent, and drying quickly. The red oxide of zinc also makes an excellent quickly drying red paint. By adding lamp black, prussian blue, &c. several shades of color may be readily obtained, free from the disadvantages of *lead.*

Franklinite is also used to purify iron, and to render it tough and fibrous, by freeing it from sulphur and phosphorus.

A donation of living specimens of *Trionyx ferox* and *Emys insculpta* was received from Rev. Zadock Thompson, of Burlington, Vt.

The former was taken upon a fish-hook by some boys, while fishing near the mouth of Winooski River; this is the third individual he had obtained in that neighborhood. The specimens there obtained have been much larger than the measurements given by Dr. De Kay; the shell of the smallest measured 11 inches by 9½ on the back, while the same measurements given by Dr. De Kay are 5.3 and 5 inches. Another measured 13 by 10¾ inches, which differs but little from the present specimen. The Trionyx is very aquatic in its habits; he had never known of one being found on the land. The thanks of the society were voted for this donation.

A specimen of polished Freestone, from the Acadia quarry, at Pictou, Nova Scotia, was presented by Watson Freeman, Esq.; committed to Mr. Alger.

A specimen of Copper Ore from Valparaiso was presented by J. M. Rowell, of Lynn; the thanks of the Society were voted for these donations.

Mr. Charles Booth and Dr. J. Gundlach, of Cardenas, Cuba, were elected corresponding members of the Society.

August 7, 1850.

Dr. C. T. Jackson in the Chair.

Present, nineteen members.

A letter was read from the President informing the Society that the Cambridge Mastodon was at his hall in Chestnut Street, where he invited them to compare it with the Mastodon owned by him.

A letter was read from M. Vattemare announcing that the sharks offered by the Society to the Museum of Natural History of Paris would be gratefully received by the Professors of that establishment.

In addition to the specimens of Touraine, he had recently received a case of minerals sent by the Mayor of Nantes to the Society, to be exchanged for American minerals ; he also had a copy of Catesby's Natural History of South Carolina for the Society. About to return to France in a few weeks, he requested the Society to communicate to him a series of instructions relative to its wants, which he would use all his influence to answer.

The letter, containing suggestions of great importance, was referred to the Curators.

Prof. Wyman, in alluding to the remarks of Mr. Alger at the last meeting on the carnivorous propensities of bull-frogs, said, that on dissection of a large bull-frog he had found a mouse in its stomach.

He had seen one devour a large spider which had been for a long time preserved in alcohol, an *Ascaris lumbricoides* from the human body, &c. showing that they are not at all particular in their choice of food.

Prof. Wyman announced that he had received other fossil remains of seals from the Miocene deposit of Virginia, near Richmond, with the exception of South Berwick, Me. the only locality where such bones had been found.

He had a large portion of a cranium, of a well known genus, but of a species not yet ascertained. As these bones were found at some distance from each other, farther discoveries would probably be made.

He had also received from the same locality an immense Coprolite ; according to Buckland the usual size of these bodies is about three inches ; this specimen was nine inches long, and three in diameter. It contained fragments of bones ; and internally was of a bilious brown color, perhaps accidental. It had a few marks of a spiral valve such as is found in the intestines of the cartilaginous fishes.

Dr. C. T. Jackson observed that he had received specimens from Duxbury showing the extent of our tertiary deposit.

They were a shark's tooth, a cetacean vertebra, Lignite, and a cast of Tellina, which were found in Marshfield, in a clay marl, over a green sand, thirty feet from the surface; they were precisely like those found at Gay Head.

Dr. Hitchcock considers the absence of pot-holes in Massachusetts, a fact in favor of the glacial theory, by showing the improbability of currents of water setting over the surface.

Dr. Jackson found several of these holes in Orange, N. H., filled with round, polished stones, one thousand feet above the level of the sea, in the hardest kind of granite, such as is found at Bellows Falls. The pot-holes at Orange were in some cases eleven feet deep, those at Bellows Falls five feet, so that their existence at the former place indicates a current flowing twice as long as the Connecticut River, at Bellows Falls. He also noticed striæ running in the same direction as the line of pot-holes. In New Jersey he noticed no scratches, though there is plenty of drift; but on the northeast side of a mountain ridge, eighteen hundred feet above the sea, where we can hardly imagine a current of water with the present conformation of the country, was a well-marked pot-hole, three feet deep and four in diameter, with polished bottom and lower part of sides. This locality is about two miles from Mt. Pleasant. This must have been made by a current of water setting to the northeast, as no drift scratches can be seen. At Franklin, there is another, four feet in diameter, in white limestone, where no stream now could produce it. The absence of drift scratches is interesting, as showing that the glaciers, if they produce them, must have disappeared before extending to New Jersey. Pot-holes, however, are not inconsistent with the currents of glaciers; there are frequently strong currents on the surface of glaciers, which, through crevices and holes might cause similar phenomena under the glacier.

Dr. Burnett read some observations on the relations of an order of Parasites (Lice) to the different Faunæ, as bearing 1st, on the distinct creation of types of animals; and 2d, on the local creation of these types wherever they are found.

In the general Fauna of the earth, the fact that totally distinct genera and species exist, exposed to the same external influences, is a strong argument against their being the results of modifications of a single type, and in favor of their having been created as we now see them. The same is true as regards these Parasites; we have different species, and even different genera, upon a single animal, all exposed to the same external changes. If genera and species are mere modifications of a primitive family type, we should expect to find a uniformity in the special characters of the parasites on all the species of the genera of that family. For instance, if the Sciuridæ are but modifications of a primitive type-Squirrel, we should expect to find certain parasites common to all, with a uniform specific character, without widely separated genera; which, as far as his experience goes, is not true; for though in many cases certain species of parasites are common to the whole family, yet there is an evident tendency for each species of the higher animals to have its peculiar species of parasite. Though we can easily imagine that the same species may be found in mammals and birds of the same family, with similar habits, and associating together, we cannot understand that the same species of parasite should be found in widely different families, of entirely dissimilar habits; yet such is the fact, and it is not reconcilable with the hypothesis of a successive production of types by a series of metamorphotic changes; on the contrary, it would go to show that the existing specific types were as such created.

As to the local creation of genera and species, we know that the world's animals have not that commonness which might be supposed; they have relations of a local nature, connected with a remarkable diversity of forms. At any rate, this fact is certain, that each region shows a marked tendency to have its peculiar Fauna. Climate has undoubtedly a great influence on the character of a Fauna; we see in the same zone, separated by impassable barriers, similar animal productions, though there is at the same time sufficient diversity to exclude the idea of a common origin; different countries have analogous, not identical, species. Geological data, the history of the surface of the earth, and our fast increasing knowledge of the intimate relations of animals to the circumstances in which they live, all lead to the conclusion of their local creation in their present habitats. The relations of Parasites afford considerable proofs against the hypothesis that the differences of terrestrial conditions have caused the differences in animals. We could not suppose that the lice living on European birds would be different from those of the analogous species of American birds, if they arose from a common stock; their parasites ought to agree as to species. This is not the fact; not only do the parasites of our animals, compared with analogous species in Europe, present differences greater than those of the animals on which they live, but even our species of birds or mammals, having no representative on the other continent, have their own parasites as distinct as themselves. Those animals, which by their own powers of locomotion or by human means are common to both continents, have parasites identical in character, as far as Dr. Burnett's observation goes; the lice of our cow, horse, or hog, do not differ from those of the same animals in Europe; the same is true of some birds.

Dr. Burnett thinks the legitimate inference from these facts is, that the analogous species of animals of the different continents were created as such, and therefore have their proper parasites, and did not emanate from a common stock.

The lice of the Quadrumana, or Monkeys, seem to be quite different from those of man; in fact the species of man are not found on the monkeys, except when their presence may be accounted for by accident; those of the monkeys are found only on them.

Dr. C. T. Jackson announced, that at Franklin, N. J. he had discovered in Labrador Felspar, small black crystals of Allanite containing the protoxide of Cereum, as contained in the Swedish ores.

A committee, consisting of Dr. C. T. Jackson, Dr. N. B. Shurtleff, and Dr. S. Cabot, Jr., was appointed to memorialize Congress on the subject of attaching a corps of Naturalists to the Mexican Boundary Commission.

Dr. Cabot announced the donation of *Rallus crepitans* and *Tringoides macularia* (young) from Theodore Lyman, Esq.; this is the first time, to his knowledge, that the *Rallus crepitans* has been taken in Massachusetts.

Dr. Kneeland announced the addition to the cabinet of skeletons of *Cervus Virginianus*, and *Castor fiber*.

An *Agama* from Texas, was presented by Frederic Vinton of Eastport, Me.; a large Bill-fish from Pictou, by B. Hammatt Norton, Esq., United States Consul at Pictou; a specimen of Coral from Edward Wigglesworth, Esq.; a St. Domingo Terrapin (a supposed new species) by Mr. Couthouy.

The thanks of the Society were voted to J. W. Hall, Esq.; Rev. Zadock Thompson, of Burlington, Vt.; J. M. Rowell, of Lynn; B. Hammatt Norton, Esq. of Pictou; Watson Freeman, Esq.; and Frederic Vinton, of Eastport, Me., for donations made by them, as above stated.

September 4, 1850.

Dr. C. T. Jackson in the Chair.

Present, ten members.

Prof. Wyman read, on behalf of Mr. Horatio R. Storer, a paper on the fishes of Nova Scotia and Labrador, with descriptions of new species.

This region has been but little explored by Naturalists. The paper contained a description of thirty species, of which six were new ones. He presented several specimens, for which the thanks of the Society were voted. The paper will be published in the Journal of the Society.

Prof. Wyman exhibited specimens illustrating the embryology of the Murre, *Uria troile*, in five stages of development; showing the great resemblance of the extremities to the same parts in animals both higher and lower in the scale at a corresponding higher or lower stage of development; compared with these parts in cats, squirrels, reptiles, &c. the extremities of the embryo *Murre* are precisely similar at certain stages of growth. He alluded to the great advantages for the study of embryology enjoyed on the coast of Labrador, to which the sea birds resort in immense numbers to breed in the months of June and July.

A letter from Mr. Francis Delessert, of Paris, was read by the Chairman, accompanying a historical notice of his brother Benjamin Delessert, by M. Flourens, published by the French Academy of Sciences. Baron Delessert was a member of this Society.

Dr. Durkee presented some fossil cetacean bones, from Washington Co., Alabama, the locality whence the Hydrarchos of Dr. Koch was obtained; this region is about one hundred and fifty miles north of Mobile; in it are found in great quantities cetacean bones.

The specimens of Dr. Durkee were vertebræ of the *Zeuglodon*, a cetacean. This animal was supposed by Dr. Koch to be a reptile, a marine serpent, but Dr. Wyman has exposed the fallacy of this opinion, and shown that it was a warm-blooded mammal. One of the vertebræ was fifteen inches long and nine in diameter; it was deeply impregnated with calcareous matter, and weighed eighty-one pounds. Its transverse processes were very distinct; it appeared at first sight three bones, consolidated together, but it consisted of only one with very thick epiphyses. He compared this with vertebræ from South America, and from Martha's Vineyard, and pointed out a remarkable similarity; the one from Martha's Vineyard, from a clay soil, was very light, and contrasted remarkably in this respect with those impregnated with lime.

Dr. Wyman observed that the thick epiphyses noticed in this specimen are peculiar to the Zeuglodon; here they were five inches in thickness, whereas in ordinary cetacea they are about half an inch; the cancelli, also, are of different sizes, in the epiphyses and in the body. Koch's sea-serpent was carried to Dresden, where it was described by Carus, who figured it and even restored the cranium, of which then only a portion had been found. Carus restored the cranium of a reptile, but this was a mere fiction of his imagination ; for an entire cranium has since been found, proving beyond a doubt that the Zeuglodon was not a reptile but a cetacean ; the teeth being inserted by double roots into double alveoli is positive evidence that it was a warm-blooded mammal. Müller has also carefully studied this specimen, and pronounces it unquestionably a cetacean.

Dr. C. T. Jackson presented the specimens mentioned by him at the last meeting as found in the tertiary deposit of Marshfield, and identical with those found at Gay Head.

Dr. Durkee mentioned a method successfully adopted by the farmers in Illinois and Wisconsin for curing their cattle when bitten by the rattlesnake.

It is simply to cast them, and bury the bitten part in the mud, when recovery rapidly takes place ; he mentioned cases where animals had been seen to be bitten, who recovered with no other treatment than this. He did not know if there was any thing in the mud to account for its alleged curative powers.

Dr. Durkee mentioned a popular belief at the West, that the "blow snake," so called, blows out a poisonous vapor from its mouth as a means of attack and defence.

Dr. Wyman observed that Dumeril, who has written a large work on serpents, denies totally that they hiss, a faculty which they have been supposed to possess from time immemorial ; they occasionally make a slight noise by the expiration of air from the lungs, as tortoises do ; but nothing which can be called a hissing noise.

Mr. Stodder presented some fine specimens of wheat, grown in Masachusetts by Henry Poor of North Andover.

There were four varieties, all very flourishing. This was the sixth crop that he had raised, and he is convinced that farmers will find it to their advantage to raise wheat in Massachusetts at least for their own use. From *one seed* he raised the finest specimen presented, five feet in height, containing forty straws and two thousand two hundred and fourteen seeds. The soil is clayey ; it had been limed ; common manure was employed.

Mr. Stimpson presented a specimen of *Lucina borealis*, dredged from a sandy bottom near Point Shirley.

Fragments are often found on our beaches after storms, but this is the first he had found entire.

He also presented a specimen of *Unio margaritiferus*, found in the diluvium at East Boston with Mytilus, &c. in a situation where it could not have been placed by Indians.

Mr. S. A. Bemis presented some fine drawings of the animalculæ found in Cochituate water.

Dr. Burnett presented a drawing of *Xylodes Pickeringii.*

The Secretary announced the addition to the Cabinet of the following birds, namely : —

Ardea cœrulea,	Blue Heron.
Mniotilta superciliosa,	Yellow-throated Warbler.
Mniotilta citrea,	Prothonotary Warbler.
Caprimulgus Carolinensis,	Chuck-wills-Widow, (female.)
Spiza ciris,	Painted Finch, (male.)
Parus Carolinensis,	Carolina Titmouse.
Troglodytes Ludovicianus,	Great Carolina Wren.
Culicivora cœrulea,	Blue-gray flycatcher, (male.)
Setophaga mitrata,	Hooded Warbler, (male.)
Sterna frenata,	Least Tern.

All procured in South Carolina.

He also announced the donation of some fine birds from San Francisco, California, from James C. Leighton, Esq. The thanks of the Society were voted for this donation.

Dr. C. T. Jackson announced that the Committee appointed at the last meeting to memorialize Congress in reference to a corps of Naturalists for the Mexican Boundary Commission, had drawn up a memorial, which would be presented by Senator Green, of Rhode Island.

Hon. George Washington Warren, and J. W. Bemis, M. D., of Charlestown, Mass. were elected members of the Society.

BOOKS RECEIVED DURING THE QUARTER ENDING SEPTEMBER 30.

California Message and Correspondence, (Congressional Document.) 8vo. Washington, 1849–50. *From R. C. Winthrop.*

Report of Smithsonian Institute on the History of the Discovery of Neptune. By B. A. Gould, Jr. 8vo. Pamph. Washington, 1850. *From J. Rockwell.*

G. Tilesius. Statuten des Münchener Vereins für Naturkunde. 12mo. Pamph. München, 1849. *From the Author.*

Report on the Sea and River Fisheries of New Brunswick. 8vo. Pamph. Frederickton. By M. H. Perley. *From the Author.*

Sixty-third Annual Report of the Regents of the University of New York. 8vo. Pamph. Albany, 1850. *From the Regents of the University of New York.*

American Journal of Science and Arts. No. 28. 2nd Series, for July, 1850. *From the Editors.*

Thesaurus Literaturæ Botanicæ. Curavit G. A. Pritzel. Fasciculus I. Plag. 1–10 continens. 4to. Pamph. Lipsiæ, 1847. *From Little & Brown.*

Die operative Chirurgie von J. F. Dieffenbach. Erstes Heft. Bogen 1–8. Leipsig, 1844. 8vo. Pamph. *From Little & Brown.*

System der Physiologie. Von C. G. Carus. Erstes Heft. Bogen 1–12. 8vo. Pamph. Leipsig, 1847. *From Little & Brown.*

Bulletin de la Société Geologique de France. 2ième Série. Tome VII. Feuilles 4–8, 9–13, 14–22. From Dec. 17, 1849, to April 1, 1850. VI. Feuilles 44–47. Paris. 8vo. Pamph. 1849–50. *From the Société Geologique.*

Liste des Membres de la Société Geologique. 12mo. Pamph. Paris, 1850. *From the Société Geologique.*

Proceedings of the Zoölogical Society of London. With Illustrations. Part III. July to December. pp. 99–172. Title-page and Index. 8vo. London. *From the Zoölogical Society.*

Éloge Historique de Benj. Delessert. Par M. Flourens. 8vo. Pamph. Paris, 1850. *From Francis Delessert.*

Structure and History of the Articular Cartilages. By Joseph Leidy. 8vo. Pamph. 1849. *From the Author.*

American Journal of Science and Arts. No 29. 2nd Series for September, 1850. *From the Editors.*

Received from the Courtis Fund.

Annals and Magazine of Natural History. Nos. 30 and 31. Vol. VI. 2nd Series: for June and July, 1850.

History of British Mollusca and their Shells. By Prof. Ed. Forbes and S. Hanley. Nos. 27–31. 8vo. London. 1850.

Thesaurus Conchyliorum. By G. B. Sowerby. Part XI. 8vo. London. 1850.

Annals and Magazine of Natural History. No. 32, for August, 1850. Vol. VI. 2nd Series.

Annals and Magazine of Natural History. No 33, for September, 1850. Vol. VI. 2nd Series.

Deposited by the Republican Institution.

Reports of the British Association for the Advancement of Science. Vols. for 1836, 1840, 1843–49. 8vo. London.

Lardner's Cabinet Cyclopædia. 133 vols. 12mo. London. 1835–45.

Cyclopædia of Anatomy and Physiology. Edited by R. B. Todd. Nos. 39 and 40. 8vo. London, 1850.

London Encyclopædia. 22 vols. 8vo. London, 1844–5.

Writings of George Washington. With a Life of the Author. By Jared Sparks. 12 vols. 8vo. New York, 1847–8.

October 2, 1850.

Dr. C. T. Jackson in the Chair.

Present, twelve members.

Dr. Cabot made some remarks on the glossy Ibis, which had been observed in many instances this season in New England.

The North American bird was first described by Bonaparte, who thought it the same as the *Ibis falcinellus* of the Old World; but Naturalists denied this, from the different size of the bird, and its inhabiting a different climate. One shot at Fresh Pond was presented to the Society, which Dr. Cabot thought the same as the *Ibis guarauna* of South America; but on comparing the first with a fine specimen of the last, from Chili, presented by M. Vattemare, he is satisfied that they are not the same bird, and that the specimens obtained in Massachusetts belong to an undescribed species. He will give a detailed account of the specific characters at a future meeting.

He announced the addition to the Cabinet of the European common Heron and a Turkey Buzzard in exchange with Mr. Kimball; also a female Peacock from Dr. W. T. G. Morton, for which donation the thanks of the Society were voted. He also exhibited mounted specimens of the California birds, presented by Mr. Leighton, namely, — *Colaptes rubricatus*, female, Red shafted Woodpecker; *Melanerpes formicivorus*, male, Black-bearded Woodpecker; *Agelaius gubernator*, Gubernator oriole; *Dicæum* ——— ; *Pyranga æstiva*, from Mr. Theodore Lyman.

Mr. Stimpson presented two new species of *Philine*, obtained in Boston Harbor, with descriptions as follows: —

PHILINE SINUATA. P. testâ minutâ, ovatâ, albâ, pellucidâ, longitudinaliter striatâ; spirâ conspicuâ; aperturâ anticè dilatata. Long. .07; lat. .05 poll. *Hab.* Massachusetts Bay.

The animal is two tenths of an inch in length, oblong, elongated, convex posteriorly, of a yellowish color, darkest behind, with dots and patches of white. The reflected pedal lobes are rather narrow, and terminate near the middle of the part occupied by the shell. At the posterior extremity a cavity is formed by the mantle, which is digitated and arched; within this cavity the anus is situated, and its lower margin has a notch at the centre.

The ova are deposited during the latter part of August. They are minute, white, and enveloped in a gelatinous mass, which is globular, hyaline, slightly tinged with yellowish, and somewhat larger than the animal itself.

Several specimens of this species were obtained by dredging in Broad Sound, Boston Bay, at the depth of from four to seven fathoms on a sandy bottom.

PHILINE FORMOSA. P. testâ minutâ, quadrato-globosâ, anticè subtruncatâ, albâ, nitidâ, subopacâ, posticè incrassatâ, striis volventibus, inæquidistantibus, excavato-punctatis, vel interdum undulatis, sculptâ; apice arctè et profundè perforato; columellâ sinuatâ, latè et tenuiter callo indutâ; labro posticè crenulato; aperturâ patentissimâ. Long. 18; lat. 14 poll. *Hab.* Coast of New England, north of Cape Cod.

This species is nearly allied to *P. scutulum*, Lovèn, but differs from it in its form, and its umbilicus; and it has no inflection of the outer lip. The figure of *P. scutulum*, given by Sowerby, will not apply to the species here described.

Several specimens were taken from fishes caught on the "middle bank," in seventeen fathoms; in thirty fathoms off Cape Ann, and in deep water off the coast of Maine.

Dr. Gould presented the first number of the "Journal de Conchyliologie," published in Paris, and devoted to descriptions of new Shells by M. Petit de la Saussaye. The Editor desired to exchange it for the Society's "Proceedings." Referred to the Library Committee.

He announced the donation from Mr. Lesquereux of specimens of Algæ, collected mostly in the neighborhood of Boston; a collection of American mosses was also promised by the same gentleman.

Dr. Gould read extracts from a letter from Mr. Charles Lyell, in which he alluded to the great advantages the hippopotamus, recently arrived in England, had conferred on the Zoölogical Society of London, by freeing it from all pecuniary embarrassments.

Dr. Gould also brought a fine specimen of *Pterogorgia setacea*, from the West Indies, presented by Mr. C. O. Boutelle, for which the thanks of the Society were voted.

Dr. J. Mason Warren related the following case which recently came under his care: —

A man from the country came to him, having, as he said, a cancerous tumor of a peculiar appearance in his arm-pit; on examination was seen a round, white tumor, hanging from a very inflamed and swelled base. On turning it up, he noticed on each side a regular series of hairs, too regular for any morbid growth; on moving these hairs to one side, they were quickly brought back to their original position; the tumor was very tender to the touch. He seized the tumor and gently pulled it away; on placing it on the table, it ran quickly across it. The man was working in a field, when he felt a sudden pain and itching in his axilla; a swelling quickly arose, very tender and inflamed, which was supposed a cancer; he came to Boston to be operated on, with the above result. This animal was the common wood-tick (*Ixodes*); it was as large as a bean, very round and plump; in its dried state it was one half an inch long.

Dr. Gould mentioned a similar case, where a man, who was about to have a tumor on the shoulder removed by ligature, was freed from an *Ixodes*, three times as large as the one exhibited by Dr. Warren. They are very common in the woods at the South.

Dr. Kneeland announced the addition to the Cabinet, by purchase, of a very fine and uncommonly large skeleton of the American Black Bear, *Ursus Americanus*.

Dr. C. T. Jackson made some observations on the age of the Sandstones of the United States.

Elie de Beaumont is of the opinion that the Lake Superior Sandstone belongs to the Silurian system, and is not so high in the geological series as the new Red Sandstone. Dr. Jackson thinks that the age of all our red Sandstones is questionable. Dr. Hitchcock has supposed the Connecticut River Sandstone to be the new red Sandstone, from comparison of it with specimens from Nova Scotia; Dr. Jackson thinks both of them to be lower down than the new red Sandstone; he has found this rock in Maine lying immediately over the Silurian limestone. Dr. Jackson believes that, whatever be the age of this formation, it is identical in Nova Scotia, Maine, Massachusetts, and New Jersey. He agrees with Elie de Beaumont, that what is here called the new red Sandstone is not the same as the new red Sandstone (properly so called) of Europe ; that it belongs to the Silurian system. Confirmed by a recent examination of the fossils by Mr. Wells, of Cambridge, Mass. Wherever it occurs, from Nova Scotia to New Jersey, there are the same masses of *trap* found running through it ; but the trap never comes up as *dykes*, but always as *beds ;* always *between* the strata of Sandstone, never *through* them. The under surface, on the leaning side, is converted into amygdaloid ; at this point, where the trap and sandstones come into contact, *native copper* occurs ; the accompanying minerals are nearly the same from Lake Superior to Nova Scotia. The direction of the strata, in nearly all cases, is E. N. E. and W. S. W. The masses of trap, in both countries, curve to the N. W., showing that the direction of upheaval was the same over the whole extent from Lake Superior to Nova Scotia.

If the Connecticut River Sandstone belongs to the Silurian system, it will show that birds made their appearance on the earth some time before Geologists have generally supposed.

There are many difficult problems in connection with the Sandstones, which geology as yet has not materials enough to solve.

October 16, 1850.

Dr. A. A. Gould in the Chair.

Present, thirty members.

Prof. Agassiz expressed his dissent from the opinions of Dr. C. T. Jackson on the age of the Connecticut Sandstones, as given at the last meeting.

He believed, with Dr. Hitchcock, that they were of more recent formation. Their fossil fishes were in exact relation with the alleged age of the strata ; and he cannot think this formation an exception to the general law of deposit. Mere mineralogical qualities should not outweigh the geological evidence in favor of a more recent formation ; he cannot admit here so remarkable an exception as is implied in the hypothesis that the age of these sandstones may indicate the existence of birds at an earlier period than geology has fixed by the regular succession of fossil remains.

Dr. Jackson replied, that his remarks were thrown out rather as hints to excite inquiry than as assertions upon which he was very positive ; amid the discrepancy of authors, he merely mentioned certain facts in his possession which he thought might throw some light on this obscure subject.

He said he was happy to hear Prof. Agassiz's opinions upon this subject, but he regretted that he had not heard his full statement at the last meeting. Prof. Agassiz misapprehended some points which were not given by Dr. Jackson as results but were proposed as questions for consideration. He does not wish to be understood as affirming that bird tracks are found as low as the Silurian system, but asked if the strata in which they are found may not be older than the new red Sandstone of Europe. As to the beds containing fossil fishes, he understood Mr. Wells to say, that they occupied upper and unconformable strata of fine-grained shales or slates resting upon the more highly inclined red Sandstones of the Connecticut River. This fact he had also learned from others who had examined the fish deposits lower down the river, and he had no doubt of the correctness of Mr. Wells's opinion, that the fossil fishes belong to more recent and upper beds. He understood from Mr. Redfield that he did not regard the fishes of the New Jersey Sandstone as identical with those of the new Red of Europe, and such was the general opinion of those familiar with the deposits.

In his communication at the last meeting, Dr. Jackson stated the facts that he positively knew, distinct from matters of opinion, and explained the true position of the red Sandstone rocks from Lake Superior to Nova Scotia. He then repeated his demonstrations, showing that the red Sandstone of the Connecticut River rests directly upon the granitic rocks of Northfield, on the borders of New Hampshire, as explained in his Final Report on the Geology of New Hampshire.

He also showed that the red Sandstone of Trescot, Maine, rests directly upon the Silurian limestone, equivalent to the Niagara group and contains an abundance of Silurian fossils. The Sandstone at that locality is conformable with the strata of the Silurian limestone upon which it rests and therefore is an upper member of that group. Mr. Dawson had also satisfied himself that the red Sandstone of Nova Scotia passes beneath the Coal formation and is therefore not of the new red Sandstone formation. President Hitchcock, who formerly regarded the Connecticut River Sandstone as the old Red, altered his opinion upon comparing the lithological characters of that rock with the supposed new Red of Nova Scotia, furnished him by Mr. Alger and himself in 1827. Dr. Jackson is now convinced that the red Sandstone of Nova Scotia is not equivalent to the new Red of Europe. He doubts, therefore, the age of the lower strata of Connecticut River and is convinced that they are older than those of the fish deposits of the upper slates.

He alluded to the delusions that have arisen in searching for coal in the Sandstone of Connecticut River, under the idea that it is the new Red, and consequently over the carboniferous deposits. The error is therefore one of practical importance and should be corrected. It is certain that the carboniferous rocks do not exist below the red Sandstone of Connecticut River, and that the Sandstone in question is deposited in a trough of the older rocks commonly called primary. This may be seen at Northfield and along the edge of the Sandstone basin lower down the river.

Dr. Jackson drew upon the black board a series of diagrams demonstrating the true position of the Sandstones of the Connecticut River, of Maine, Nova Scotia, and Lake Superior. He said, that so far as his own observations go they would tend to support the views which Elie de Beaumont had conceived from the facts which he had learned from him in 1844 and '45, and from Mr. Logan quite recently. All the facts that had come to his knowledge indicated that the Sandstone of Kewenaw Point and Isle Royale was an upper and not a lower member of the Silurian group, in accordance with the inferences drawn by De Beaumont from its orographic positions.

Dr. Jackson then explained how he and other Geologists had been in the habit of explaining the anomalous facts concerning the position of these rocks, under the idea that they might be the new red Sandstone deposited on any rock that happened to be uppermost at the epoch of that formation. It is certainly a very curious fact, that the coal measures of Mansfield, Mass., and of Rhode Island are also deposited in a so called primary trough, or in a trough of Granite gneiss and mica slate rocks without any carboniferous limestones and without any cappings of new red Sandstone strata. While on the Connecticut River the Sandstones which have been supposed to be equivalent to the new Red are also deposited in a similar trough and contain no coal rocks beneath them. These facts need much and prolonged research for their full explanation, and we have not yet obtained all the data that are needed for a full and rational discussion of the subject.

Mr. Wells read a paper, in connection with this subject, in which his object was to show that the reference of all the stratified and fossiliferous rocks of the Connecticut Valley to one formation has been made upon insufficient data, and that it is doubtful whether the upper members of these Sandstones belong to the new red Sandstone or to the Oolitic period.

It is difficult to determine the age of these rocks, since, owing to the absence of all underlying carboniferous or older sedimentary rocks on the one hand, or of any superimposed fossiliferous formations on the other, Geologists have been compelled to rest entirely upon their lithological characters and the doubtful evidence of fossils contained in them. He thinks that they consist of two distinct formations, differing widely from each other. In the lower beds we find rocks only which exhibit the characteristics generally attributed to the new red Sandstone; of a color ranging from a light to a brownish red, and differing greatly as regards fineness. The rocks lying above these, which he would refer to a different formation, consist of red, blue, and black shales and slates, with a few beds of limestones and conglomerates; they exhibit none of the massive compact character of the lower rocks, and are generally unfit for building purposes. It is to these various colored shales that the fossils of the Connecticut Valley are wholly confined; so far as he knows, not a single well characterized organic remain has ever been discovered in the lower beds.

The fossils peculiar to these upper beds are the well known impressions of the feet of birds; several varieties of fish in considerable abundance; impressions of stems, leaves, and grasses; coprolites, and numerous organic remains of a doubtful character; and, in at least two instances, bones of large vertebrata, (at East Windsor, Ct. and South Hadley, Mass.) He thinks that this limitation of the fossils to the upper beds, and the different lithological characters, warrant the conclusion that the upper members of the Connecticut River Sandstones are of an entirely different age from the lower. Throwing aside the general lithological resemblances existing between these rocks and the European new Red, and the Sandstones of the South Eastern States, there is no more reason for referring them to the new red Sandstone than to the Sandstones of the Silurian period.

At a point six or eight miles west of Springfield, he discovered the shales and slates of the upper beds resting unconformably upon the lower Sandstones. The lower rocks, so far as observed, stood at an angle of 70° to 80°, and even 90°, while the upper beds had only an inclination of about 10° east. The upper rocks in this vicinity appear to be made up entirely of tidal deposits, or of the sediment left by the successive risings of a river overflowing a low, flat country; since they are composed of innumerable parallel layers, readily splitting by the pressure of the hand, and rarely exceeding the tenth of an inch in thickness. Each of these strata also exhibits upon its surface irregular markings, which generally extend through the plate; it is very evident that these marks are merely mud cracks, filled up by a subsequent deposition; in fact, more conclusive evidence of repeated submergence and exposure could not be produced.

Do these Sandstones belong to the upper members of the Triasic period, or to the Lias? He thinks there are objections to referring them to the former period, which do not apply to the latter. They are briefly these: 1st, from the evidence of the existence of birds during their deposition; in no other portions of the new red Sandstone are there similar impressions of bird feet, and the existence of birds on the earth during the Triasic period is wholly unsustained by any other geological evidence; 2nd, from the occurrence of the bones of large vertebrata; 3d, from the occurrence of remains resembling those of the Oolite, and from the abundance of fossils, which is not characteristic of the new red Sandstones of this country. The character of the fishes has been considered a strong argument in favor of these Sandstones belonging to a period anterior to the Lias; it has been assumed that they possess all the characteristics of the older types, that they have heterocercal tails and rhombic scales. But this is not the case, for the fishes of the Connecticut Sandstones, all coming from the upper beds, hold an intermediate position between those with heterocercal and those with homocercal tails, and may be referred with equal propriety to the Lias Sandstones and to the Triasic period. If we still conclude to refer these upper beds to the new red Sandstone, it must be admitted that we have for the first time a division marked out in these rocks, which may correspond with the divisions recognized in the same formation in Europe.

Prof. Agassiz alluded to a section at Nahant, where, under masses of Sienite, may be seen a regular series of strata, containing large quantities of fossil corals in an imperfect condition; he thinks these may prove a continuation of the Mansfield coal formation. Perhaps the whole matter will be explained by the strata in question proving to be metamorphic rocks.

Mr. Desor remarked, that such different inclinations in Sandstone strata do not prove a difference of formation. At the "Pictured rocks," strata are found with an inclination of 36° to 40°, while the next are horizontal, in some cases for a quarter of a mile; it is the same as what is seen in the tertiary deposits, and called by Mr. Lyell "cross formation."

Dr. Buckminster Brown presented, in the name of Mrs. H. G. Otis, a specimen of the Caterpillar fungus, or vegetable caterpillar, *Spheria Robertsii.* This rare insect was brought from New Zealand.

The plant springs from the neck of the animal, and grows two or more inches in length ; in this specimen it has unfortunately been broken or cut off near the head. There is another species of this fungus which has been found developed in the bodies of full grown wasps. Rev. Mr. Berkely, in the London Journal of Botany says, that it commences its development on the living wasp, and, according to Dr. Maddiana, arrives at its full growth during the life of the insect; with the caterpillar this is impossible, for it has been ascertained that the entire body of the animal is filled with a pith, or corky vegetable substance, displacing the intestines. In other words, the whole insect, according to Dr. Hooker, is metamorphosed into vegetable, with the exception of the skin, which remains sound, and the intestines. The transformation takes place while the animal is under ground, where it buries itself for the purpose. The same author is of opinion that the spores of the fungus are lodged in the first joint of the neck, and the caterpillar settles head upwards to undergo its change, when the vegetable develops itself.

One of the species of this insect is a celebrated drug in the Chinese Pharmacopœia ; but from its rarity is only used by the Emperor's physician. The Chinese have a notion that it is a plant in summer, and a worm in winter. In volume 2nd, of the work referred to, is a plate showing the plant as it appears when fully developed. The thanks of the Society were voted for this donation.

Prof. Agassiz gave a description of a new naked-eyed Medusa, belonging to a new genus, which he proposed to call *Rhacostoma Atlanticum.*

Instead of the usual structure in these animals with eight or ten tentacles, there are in this over one hundred appendages to the mouth, and five or six hundred at the circumference. The mouth is so wide, that it has been supposed to be wanting; the union of the appendages to the mouth into a firm cord forms an alimentary cavity ; these are formed of very large polygonal cells, which give a remarkable power of enlarging and contracting this cavity. This is the largest of the family. In the circular tube of the margin is a nervous cord ; at night it emitted light, and, when stimulated, the whole outline of the nervous system was seen as an illuminated diagram of a golden yellow color ; so that in this animal at least, the phosphorescence took place in the substance of the nervous cord.

The characteristics of this animal are the extraordinary number of the tubes radiating from the central cavity, and its remarkable power of enlarging and contracting.

The following shells from the United States Exploring Expedition were described by Dr. Gould : —

Mytilus (Modiola) flabellatus. T. transversa, elongata, trapezoidea, trifariam cuneata ; umbonibus minimè terminalibus, acutis, attigentibus ; declivitate umbonali ventricoso, angulato ; marginibus rectilineatibus ; latere postico obliquè truncato, haud angulato ; epidermide anticè nitido, exusto, posticè flavo-viridi, flosculis rigido : intus exalbida. Long. 4 ; alt. $1\frac{3}{4}$; lat. $1\frac{1}{4}$ poll. *Hab.* Puget Sound, Oregon.

A very well marked species, more than usually cuneate, and with the beaks quite remote from the summit.

Mytilus (Modiola) areolatus. Testa transversa, ovato-elongata, incurvata, tumida ; umbonibus approximatis, angulatis, ferè terminalibus ; margine dorsali arcuato ; margine ventrali fornicato, valdè hiante ; epidermide nitido, castaneo, portione antico-ventrali sulco limitato : intus alba, limbo dorsali purpurascente. Long. 2 ; alt. $1\frac{1}{4}$; lat. 1 poll. *Hab.* New Zealand.

Somewhat like *M. vulgaris ;* the beaks are nearly terminal, the byssal opening broader and nearer the beaks, the ventral margin arching inwards instead of outwards at this point ; the epidermis is darker and more shining, and the nacre is different.

Mytilus (Modiola) hepaticus. T. parva, elongata, ovato-triangularis, anticè angustata, ventricosa ; margine dorsali angulato ; umbonibus acutis, angulatis ; epidermide tenui, livido-corneo, versus fastigium umbonalem flavescente ; intus punicea, luteo-marginata. Long. $1\frac{1}{4}$; alt. $\frac{3}{4}$; lat. $\frac{5}{8}$ poll. *Hab.* Feejee Islands.

A small, elongated species, with its dorsal edge obtusely angular, but best distinguished by its peculiar lurid exterior coloring, and its reddish molybdæna-colored interior.

Mytilus pyriformis. T. solida, elongata, ovato-trigona, ventricosa, rosacea, epidermide piceo induta; margine ventrali inflecto, radiatim sulcato; fastigio umbonali tumido, concentricè undulato-striato: intus livescens; cardine edentulo. Long. $3\frac{1}{2}$; alt. $1\frac{3}{4}$; lat. $1\frac{1}{2}$ poll. *Hab.* South Seas.

The similarity of the dorsal and ventral curves; its inflated ventral portion, its great lateral diameter, its peculiar coloration and striation are well marked.

Mytilus divaricatus. T. ovato-triangularis, arcuata, præter regionem byssicalem undique radiatim costato-sulcata, sulcis profundis, remotis, interdum divaricantibus; apice peracuto, angulato; margine dorsali haud angulato, portione ligamentali arcuato; margine ventrali recto; epidermide luteo-corneo posticè fuscescente; intus albida, posticè livescens. Long. $1\frac{9}{10}$; alt. $\frac{9}{10}$; lat. $\frac{3}{4}$ poll. *Hab.* China Seas.

In general aspect it is like *M. Magellanicus*, but is more angular, the grooves are deeper, more numerous and more generally distributed. The grooves are distributed as in *M. hamatus*, but are much larger.

Mytilus algosus. T. transversa, subcylindrica, elliptico-triangularis, valdè erosa, epidermide tenui, intensè smaragdino induta; margine dorsali angulato, posticè ad marginem ventralem rectum parallelo; latere postico rotundato; fastigio umbonali tumido, obtuso; cardine edentulo: intus punicea. Long. $1\frac{3}{4}$; lat. $\frac{5}{8}$; alt. $\frac{5}{8}$ poll. *Hab.* South Seas.

The slender cylindrical form, very dark green epidermis and interior coloration are good diagnostic characters.

Mytilus trossulus. T. parva, elongata, subarcuata, nitida, coracina, subtus cœrulea; umbonibus remotis excurvatis, 5-denticulatis; marginibus sub-parallelis; margine ligamentali adscendente, recto, angulato; fastigio umbonali tumido, obtuso; intus cretato, limbo atro; cicatrice palleali lineari. Long. $1\frac{1}{4}$; alt. $1\frac{3}{5}$; lat. $\frac{1}{2}$ poll. *Hab.* Killimook, Puget Sound, Oregon.

It is more slender and more cylindrical than *M. edulis;* the dorsal wing is less elevated, the posterior slope rectilinear; the color is more glossy jet-black and without radiations, and there is a difference in the form of the muscular impression.

Mytilus (Modiolarca) pusillus. T. parva, transversa, subcylindrica, ovalis, solida, concentricè striata; marginibus subparallelis; latere antico truncato, angulo ventrali obtuso; latere postico latè rotundato; umbonibus tumidis, subterminalibus, contortis; colore cinereo, vel rubro-tincto. Long. $\frac{1}{5}$; alt. $\frac{1}{8}$ poll. *Hab.* Terra del Fuego.

This curious little shell is interesting from its being a representative from the southern seas of a form not uncommon in northern waters.

Pecten caurinus. T. trigono-orbicularis, haud crassa, inequivalvis, sub-equilateralis; valva superior convexiuscula, rubra, striis concentricis tenuibus insculpta, costis humilibus rotundatis vel interdum sub-duplicatis ad 20 ornatis: valva inferior convexa, alba, versus marginem rubricans, radiis ad 22 elevatis, quadratis, longitrorsum striatis; natibus rosaceis compressis; auribus transversis, sub-equalibus, radiatim striatis: intus lactea, rosaceo fimbriata. Long. $2\frac{3}{4}$; lat. $2\frac{1}{4}$; alt. 1 poll. *Hab.* Port Townsend, Admiralty Inlet, Oregon.

Of the size and aspect of *P. maximus* and *Magellanicus*. The lower valve has the ribs like *P. Jacobæus*, only they are not furrowed.

Pecten hericius. T. rotundato-triangularis, equilateralis, equivalvis; valvis convexis, sub-tumidis: valva superior rosea, lineis exilibus concentricis exasperata, et costis ad 24 angulatis, alternis majoribus et spinis erectis fornicatis insculpta: valva inferior pallidior colore saturatiori zonata, costis sub-equalibus spiniferis armata; natibus acutis, prominentibus; auribus obliquis valdè inequalibus radiatim squamoso-striatis; intus porcellana; marginibus crenulatis, rosaceis. Long. $4\frac{1}{2}$; alt. $1\frac{1}{4}$; lat. $4\frac{3}{4}$ poll. *Hab.* Straits of De Fuca, Oregon.

A very beautiful species, much like *P. pallium* beneath, but remarkable for the distant ranges of elevated spines on the alternate ribs, the intervening ones being quite depressed, and with merely fine squamous striæ, like the rest of the surface.

Pecten lætus. T. ovato-triangularis, ventricosa, equivalvis, dilutè rosea albo 5–6-radiata: margine ligamentali obliquo, auriculis valdè inequalibus, obliquis; auriculâ byssicâ profundè

fossato-emarginatâ, radiatim sulcato-costatâ, costis numerosis, inequalibus argutè muriculatâ; intus albido-incarnata. Long. $1\frac{4}{5}$; alt. $\frac{3}{8}$; lat. $1\frac{3}{4}$ poll. *Hab.* New Zealand.

Of the same type as *P. Islandicus*, but is small, more convex, and the sculpture coarser; the groove separating the auricle from the body of the shell is remarkably deep.

Ostrea circumsuta. T. solida, elongata, ovata, cinerea, inequivalvis, marginibus undulatis: valva superior denticulis radiantibus marginalibus in foveis sub-marginalibus valvæ inferioris aptantibus: area cardinalis triangularis, contorta, longitrorsum fossata: interior alba, limbo violacescente. Long. $1\frac{1}{2}$; lat 1 poll. *Hab.* Feejee and Samoa Islands.

The distinctive characters are the denticles, about twice as long as broad, around the entire margin, tinged with violet. In young specimens the purple coloring is wanting.

Ostrea mordax. T. petrosa, angusta, lunata: valva inferior concava, digitis triangularibus erectis fuscescentibus marginata: valva superior minor, planulata, margine profundè sinuato et granulato, sinibus cum digitis coaptantibus: interior albida, olivaceo-maculata; cicatrice elongatâ, valdè incrassatâ, nigrâ: area cardinalis planulata, lata. Long. 2; lat. 1 poll. *Hab.* Feejee Islands.

The horizontal digitations of the upper valve fitting into the erect canine teeth of the lower valve, together with the denticles within, and the black elevated cicatrix, may serve to identify this species. The upper valve fits so deeply and so closely into the lower that it is nearly impossible to separate them without fracture.

Ostrea glomerata. T. crescentica, lata, sinistrorsum arcuata, solidiuscula, planulata, scabriuscula, laminis dentatis propè marginem foliata, nigricans et albo-radiata; margine undulato: interior alba; foveâ apicali profundâ; cicatrice nigricante; marginibus aut simplicibus aut lineolatis et propè cardinem granulatis; limbo corticali purpureo et viridi variegato. Long. et lat. 2 poll. *Hab.* New Zealand.

This may possibly have been described, though no figure or description answers to the specimens I have seen. *O. spathulata* and *denticulata* correspond most nearly. The deep umbonal pit of the lower valve, its dark frilled upper margin, and the few denticles near the hinge are among its peculiarities.

Ostrea discoidea. T. subcircularis, planulata, tenuis, purpurea: valvâ superior striis crebris albidis radiata; valva inferior major, radiatim plicoso-rugosa; colore saturatiori: cavositas parva, argentata, purpureo-marginata; margine propè apicem plicoso-crenulato. Long. $1\frac{1}{2}$; lat. 2 poll. *Hab.* —— ?

The characters of the single specimen of this delicate and well-formed oyster are so diverse from all others, that notwithstanding the usual inconstancy of form in this genus, I think it may be safely pronounced new. The small, purple-striped West India Oyster (*O. Brasiliana*) is similar to it.

Terebratula caurina. T. parva, fusco-cinerea, transversa, convexiuscula; quincuncialiter punctata, costis angulatis ad 12 interdum bifurcatis radiata; margine ventrali circulari, flexuoso; apice acuto, rectangulari; lateribus rectilineâribus, incumbentibus; rostro brevi, vix curvato; foramine circulari, interrupto: apophysis branchialis tenuissima, angustata. Long. $\frac{1}{2}$; lat. $\frac{11}{20}$; alt. $\frac{1}{5}$ poll. *Hab.* Puget Sound.

T. australis is closely allied, but is more elongated and more convex; the beak is also elongated and the ribs are less prominent.

Terebratula Patagonica. T. parva, solidula, albida, ovato-triangularis, sub-trilobata, quincuncialiter punctata: valva opercularis plana: valva major convexa, sub-gibbosa, costis tribus medianis et utrinque costis quinque divaricantibus ornata; rostro brevi, marginibus inflectis; foramine magno, rotundato: apophysis branchialis exilis. Long. $\frac{1}{3}$; lat. $\frac{1}{4}$; alt. $\frac{1}{5}$ poll. *Hab.* Coast of Patagonia.

A smaller and less transverse species than the preceding, and the disposition of the ribs is quite different. It is also closely related to *T. australis*, but differs from it in the same respects.

Terebratula pulvinata. T. tenuis, lenticularis, orbiculato-trigona, albida, quincuncialiter punctata: valva minor convexa, latior quam longa, marginibus lateralibus rectis: valva major convexior, æquè longa ac lata; apice rectangulari, truncato, lateribus incumbentibus; foramine modico, circulari: apophysis branchialis tenuissima, reflexa, incumbens. Diam. $\frac{5}{8}$; alt. $\frac{1}{4}$ poll. *Hab.* Puget Sound, Oregon.

It has the same form and color and surface as *T. vitrea*, but is more rounded in front, the incurved areas of the beaks much broader and flatter, the ligament aperture larger, &c. Like other species of the genus, it varies much in form, some being quite globose, while others are compressed.

MACTRA DEBILIS. T. parva, alba, tenuis, transversa, elongato-ovata, anticè ovata, posticè acuta, valdè hians; valvis tumidis, posticè compressis; umbonibus eminentibus acutis, antemedianis: cardo debilis; dente V-formi parvo; dentibus lateralibus curtis, acutis. Long. $1\frac{5}{8}$; alt. 1; lat. $\frac{1}{2}$ poll. *Hab.* Singapore.

A very delicate species, resembling in all its outlines small specimens of *Mya arenaria.*

Mr. Girard read a paper on the development of *Planocera elliptica,* in which he traced the egg through a series of successive periods.

1st. The period of evolution — from the origin of the egg to the moment when it is laid; it originates like organic cells, generating its mass around a new centre of attraction till it is capable of leading an independent life; during this time the egg depends upon the mother. 2nd. Period of preparation — from the laying of the egg till the manifestation of the embryo; the vitelline mass divides, and prepares its substance for the future being; during this time the egg is immovable, but is connected with the parent. 3d. Period of the embryo — the vitelline sphere moves within the egg-membrane, assumes various forms, and then escapes. 4th. Period of the larva — the young animal moves freely about, assuming different shapes, till it is transformed into a mummy-like body. 5th. Period of the chrysalis — differing as widely from the larva as in the butterfly; the analogy is complete in its external features.

He places *Planariæ* rather among Mollusks than among *Articulata.*

Prof. Agassiz had some time since observed that the water pores on the margin of the disc, in *Echinoderms*, especially in *Echinarachnius*, were different from the ambulacral tubes and pores.

In regard to the resemblances of *Medusæ* and *Echinoderms*, he would say that *Scutella*, for instance, is only a jelly-fish, in whose substance lime is deposited. Both have the water-tubes; only in *Medusæ*, there is a closed system, while in *Echinoderms* the water is introduced through open pores. The shell of *Echinoderms* is then a modification of the gelatinous body of *Medusæ*, by the deposition of lime in the jelly.

Prof. Jeffries Wyman gave an account of dissections of some of the blind animals from the Mammoth Cave, Kentucky.

In examining the fishes, his results were nearly the same as Müller's, who found rudiments of eyes, or black points of pigment, but no cornea, no optic nerve, no ocular contents. Dr. Wyman, however, found no eye spots. As the small filaments of the fifth pair of nerves could be distinguished, he is confident the optic nerve could not have escaped his careful examination, if it had existed. The optic lobes existed; according to the general rules of physiology these should not exist, as they bear a strict relation to the sense of sight, which receives its nerve from them; both morbid and comparative anatomy show that disease of the eye impairing or destroying vision, or a naturally deficient sight, are accompanied with a corresponding diminution or atrophy of the optic lobes. Here the optic lobes were not so large as in the allied fishes, but yet they were of good size, and nearly as large as the cerebral lobes. This fact would lead us to inquire if these lobes are the seat of any other function than that of sight.

In the craw-fish, there is the eye-pedicle, but there are no facettes; only simple integument covered with hairs. The crickets, with long antennæ, have as well developed eyes as crickets living in the light.

Mr. Desor made some remarks on the methods pursued by the Indians for preserving their venison and pemmican without salt; preparing a very wholesome and nutritious food without that salt which has been generally supposed so necessary for perfect nutrition. Dr. Cabot alluded to certain experiments showing that salt considerably increases the nutritive properties of food.

Dr. Cabot announced the addition to the Cabinet of the male and female Wood Grouse, Guinea Fowl, common Pheasant, and two Penelopes, in exchange with Mr. Kimball; of Schinz's Sandpiper and Scarlet Tanager (changing plumage) from Mr. Theodore Lyman; and a donation of $10, from Mr. G. Howland Shaw.

Dr. Kneeland announced the addition to the Cabinet, by exchange, of a skeleton of a young fallow deer, *Cervus dama*, Lin.

Mr. Algernon Coolidge, of Boston, and Mr. James P. Low, of Charlestown, were elected members of the Society.

November 6, 1850.

Dr. J. C. Warren, President, in the Chair.

Present, thirty-three members.

Dr. Warren announced the arrival at the Society's Rooms, of a portion of the valuable donation of casts of the Himalaya fossils, from the Hon. East India Company of London; consisting of forty-one specimens, mostly of Mammalia. The collection is peculiarly rich in Pachydermata, especially Mastodons and Elephants, and will add a number to the species of both these genera. Among the reptiles, were a cranium, humerus, and parts of the sternum of *Colossochelys atlas,* which must have been of an immense size. With reference to this, Prof. Agassiz observed, that he had found at Philadelphia a femur of a gigantic turtle, taken from the green sand of New Jersey, which he thinks must have been larger than the Himalaya species, judging from the size of the femur, which was larger than that of the rhinoceros ; he had named it *Atlantochelys.*

Letters from Dr. Warren, Hon. Abbott Lawrence, and Mr. Charles König of the British Museum, were read by the Secretary, in reference to this donation and the exchange of specimens.

The thanks of the Society were voted to the Hon. East India Company for this very valuable donation, and to the Hon. Abbott Lawrence, and to Sir John Richardson for their kind offices and aid in securing it for the Society.

Dr. C. T. Jackson presented, in the name of Mr. Charles Hoffman, of Salem, a skull of a Hippopotamus, from the river Nunez, West Africa. Referred to Dr. Wyman. The thanks of the Society were voted for this valuable donation.

A letter from M. Vattemare was read by the Secretary, announcing the donation of "Catesby's Natural History of Florida," &c. for the use of the Society, and requesting its promised specimens.

Dr. C. T. Jackson presented to the Society a copy of his Report on the Mineralogy and Geology of the Mineral Lands of the United States in Michigan, printed under a Resolve of Congress.

Dr. Gould exhibited the Ixodes mentioned by him as having been mistaken for a tumor ; and gave a description of its apparatus for retaining its firm hold of the skin. From this description, Prof. Agassiz thought the species described by Müller, was quite different.

Mr. Desor exhibited Prof. Vogt's new classification of the animal kingdom in his new *text-book* of Zoölogy, as follows : —

Prof. Vogt's New Classification, as it is to be adopted in his Text-Book of Zoölogy.

DEPARTMENT.			CLASS.	ORDER.
1. Protozoa. — No sex. No egg.			Rhizopods,	Monosomatia, Polythalamia,
			Infusoria,	Astoma, Stomatoda.
2. Radiata. — Embryo growing out of the whole egg. No distinct nervous system.			Polyps,	Hexactinia, Pentactinia, Octactinia.
			Hydromedusæ,	Hydroïds or incomplete Medusæ, Medusæ.
			Siphonophora,	Siphonophora.
			Echinoderms,	Crinoids, Stellerids or Star Fishes, Echini or Sea Urchins, Holothurii.
3. Worms. — Bilateral Embryo growing out of the whole egg. No separate Blastoderm. Nervous system systematic.			Vesicularii (Rundwürmer)	Gregarina, Echinorhynchi, Gordiæ, Nematoids.
			Planularii,	Cestoidea, Trematoda, Planariæ, Nemertini.
			Rotatoria,	Fixa, Natantia.
			Annelids,	Bdellina, Gephyrea (Echiurus, Sipunculus) Lumbrici, Tubicola, Errantia.
4. Molluscs.— Embryo, growing out of the whole egg. Nervous system asymmetric.	Sub-department, *Molluscoidea.* One single nervous ganglion.		Bryozoa,	Stelmatopoda, Lophopoda.
			Ctenophora,	Beroïda.
			Tunicata,	Ascidiæ, Biphora.
	Sub-department, *Mollusca.* Scattered nervous ganglia.	Acephala,	Sub-class: Brachiopoda,	Hippuridea, Regulares.
			Sub-class: Lamelli branchiata,	Pleuroconcha, Orthoconcha, Inclusa.
		Cephalophora.	Sub-class: Pteropoda,	Pteropoda.
			Sub-class: Heteropoda,	Heteropoda.
			Sub-class: Gasteropoda,	Branchiata, Pulmonata, Articulata (Chiton.)
5. Cephalopods. — Yolk cephalic.			Cephalopoda,	Tetrabranchiata, Dibranchiata.
6. Articulata. — Yolk dorsal.				
7. Vertebrata. — Yolk ventral.				

As will be seen from this Synopsis, the new classification is based on principles of comparative anatomy and embryology combined. From this point of view no naturalist was better fitted for the task than Prof. Vogt, being equally eminent in both branches. We understand that it has received the sanction of the leading zoölogists of Germany and the continent of Europe, and may therefore be considered as the expression of the actual state of the zoölogical science in those countries.

Besides the four departments of the classification of Cuvier, Mr. Vogt admits three additional ones, making in all seven great divisions or departments, which he calls circles, (Kreis.) The new departments are those of the *Protozoa*, the *Cephalopoda*, and the Worms. The first embraces the *Rhizopods*, of M. Dujardin, erroneously classed among the *Cephalopods* by Lamarck, and many of the *Infusoria*, including thus the lowest of all animals. The second of the new divisions includes the cuttle-fishes and kindred animals, which figure in Cuvier's system as a mere subdivision of the Molluscs. They are here raised to the rank of a department, on the ground of their embryological development, which is known to differ widely from that of the other Molluscs. The most important improvement, however, concerns the Worms, which Prof. Vogt separates entirely from the Articulates, and which he subdivides into four classes, including, besides the Annelids and intestinal worms, a number of other animals, which in the other systems figure partly among the Radiata, partly among the Infusoria. The department of Mollusks undergoes also some essential modifications in its subdivisions, inasmuch as the Brachiopoda are separated from the Acephala as a distinct sub-class. Finally, we find the Medusæ classified here for the first time, according to their true affinities. The subdivisions of the departments of Articulata and Vertebrata are not given, probably because they do not differ materially from those of the other systems.

Prof. Agassiz observed, that what is true in this classification is not new, and that what appears new is not true. This same classification of the Protozoa and Worms he showed in a work of Siebold. As to the modifications in the classes, he remarked that animals to come under the same order should have homological parts; which is entirely disregarded in this classification.

Mr. Desor replied, that this classification he presented as new in comparison with Cuvier's arrangement, which was still the standard of our *text-books;* and in this respect he maintained, that Prof. Vogt's classification, as a text-book, might be considered new.

Prof. Agassiz made some remarks on the little bodies seen on Hydra, which have been described as parasites, by several authors.

These parasites at times leave the Hydra, and swim free, changing their form in a remarkable degree. In addition to the internal ring, he was able to trace rays going from the hooks to the margin, divided into numerous branches, and also rays proceeding towards the centre from this ring; the margin has a fringed undulating edge, under the tentacles. By feeding them with colors, he was able to see that the internal folds are the margin of a mouth, as in Rhacostoma, so that these parasites on Hydra are diminutive Medusæ. In the egg of Hydra, he had been able to trace all the forms from a segmented yolk to these parasites; the fresh water Hydra is the *Polypoid* form of Medusæ, while these parasites are the Medusoid form. In the American Hydra, as in the European, there are two types, the *brown* and the *green*. The American *green* Hydra, unlike the European, has the power of extending its body in a remarkable degree; he would call the American Hydra, *gracilis*. Our *brown* Hydra has very short tentacles, while the European has long ones; he would call the former Hydra *carnea*.

Dr. Wyman remarked that he had noticed numerous parallel canals running not only from, but between the "hooks" of these parasites; these had also been noticed by Prof. Agassiz. The spots described by Prof. Agassiz as gastric cavities he had seen rapidly change their size, even contract and disappear, as is the case with the spots seen in Bæccilloscina.

Prof. Agassiz, in continuation of the subject of the ramifications of the water tubes in Scutella and Medusæ, observed that in the walled Echinoderms, in those with no lateral expansions, there is in the simple thickness of the walls a complex system of water tubes. In Medusæ, whose digestive cavity communicates with the main cavity, water is introduced principally through the mouth; in Echinoderms, the water for digestion is introduced through the mouth, but the water for the interior of the body enters through the water tubes.

Dr. Wyman exhibited an embryo, six inches long, of the Greenland Whale, *Balæna mysticetus,* which presented some remarkable differences from the adult animal.

Instead of the long flukes and central depression seen in the adult, the tail of the embryo was rounded, as in the tail of Manatus; there was also a vertical crest above and below the tail. The genital organs, in external appearance male, proved to be female on the internal examination; in the early stages of the fœtus it is impossible to distinguish them externally. The thymus body was remarkably large, extending down between the lungs and heart, then underneath the latter, and with its fellow of the other side almost enveloping this organ.

Dr. Wyman observed, that in a recent dissection of an Owl, he had noticed, besides the metacarpal bone of the thumb, two movable joints, ending with a well defined claw, forming a perfect thumb, illustrating the fact, that where there is a nail there is a terminal phalanx, as in the present instance; on the contrary, where the nail is wanting, there is generally no terminal phalanx, as in the fingers of the Bat.

Dr. Cabot said, that he had remarked at a former meeting, that Bonaparte had not described the American glossy Ibis as a distinct species; he had since found that in a later Synopsis he has described it as distinct, under the name of *Ibis Ordi.*

Dr. W. L. Jones and Prof. John Leconte, of Athens, Ga., were elected Corresponding Members of the Society; and Mr. N. D. Cotton an Immediate Member.

November 20, 1850.

The President in the Chair.

Present, fifty-one members.

The President exhibited to the Society a number of specimens, in addition to those presented at the last meeting, of casts of Himalaya fossils, constituting the recent donation from the East India Company. The specimens were Crania from the families *Quadrumana, Carnivora, Pachydermata,* &c. He pointed out the distinctive characters of each.

Prof. Agassiz stated that he had been of late engaged in the study of the soft parts of American fresh water Mollusks, and their relations to the shell, with the object, if possible, of discovering some new characters on which to base an accurate classification.

He had found that in addition to the two muscular impressions in the shell usually described, there are generally two or more produced by muscular fibres springing from the foot, which impressions in some species are confluent, in others more or less distinct. Other impressions exist, produced by the gills, the palpi, and the dorsal gland. Other distinctive characters are observed in the arrangement of the mantle. In some of the Naiades the *posterior* portion of the gills only is found to be distended with eggs, at the breeding season; in others the whole gill is so distended. In the former of these, Prof. Agassiz had found the cavity containing the eggs to be limited at each end by transverse bridges beyond which the folds of the gills are closely adherent to each other, and that at this season the outer gill is longer than the inner, in both sexes. Other characters are furnished by the gills according as they are attached to the foot or the transverse muscles. Prof. Agassiz said, that he had been led by these observations to a division of the Naiades into natural genera, from the structure of the animal as well as the shell, which had not been so well done before from the shell alone. He proposed to include under one genus, *Unio alatus*, *U. fragilis*, *U. gracilis*, *U. Ohioensis*, *U. leptodon*, *U. Sayii*, *U. compressus*, and *U. rectus*. Of *Unio alatus* he remarked, that specimens from the western waters and from Lake Champlain present differences in the teeth on the hinge and in the general configuration of the shell, but not in his opinion enough to make a difference of species. *U. gracilis* and *U. fragilis*, usually considered separate species, are only distinguished by similar differences. To another genus, Prof. Agassiz proposed to refer *U. perplexus* and *gibbosus*, from characters based on the more or less circumscribed disposition of the essential internal organs. In conclusion, Prof. Agassiz said, that the fact that the Unios are viviparous, though the young are very small, and of extreme delicacy when excluded from the mother, led to interesting speculations how it could have been possible for so widely extended a family to have been distributed by any influence not primitive.

Prof. Wyman referred to a statement which he had made at the meeting of October 16th, that the size of the optic lobes is generally in relation to the power of vision.

In the blind fish of the Mammoth Cave, Kentucky, there is an apparent contradiction to this law, the optic lobes being quite disproportionate to the rudimentary eye. In man, after long blindness, the lobe opposite the affected eye is found to be atrophied. Prof. Wyman had recently had in his possession a frog that had lost the sight of the right eye by the evacuation of its humors. The eye was cicatrized, but he had no means of knowing the age of the injury. On dissection the left optic lobe was found one third less in size than the right.

Mr. Desor called the attention of the Society to the deposits of Marine shells in Maine, on Lake Champlain, and the St. Lawrence, and to the question of their probable origin.

These deposits have been referred by geologists to the Tertiary. Near Rouse's Point, at Moira, about fourteen miles from Lake Champlain, Mr. Desor had not long since discovered marine shells of the same species as those found on Lake Champlain and at Montreal, at a height of three hundred and ten feet above the sea and two hundred and twenty above the Lake. They were well preserved, most of them having the valves unseparated. It had been contended by some geologists that the shells found at Montreal could not be *in situ*, from the great elevation of the locality; but here they were evidently *in situ.* Similar deposits to those on Lake Champlain are found near the outlet of Lake Ontario, eighty feet above the Lake. Mr. Desor had thus been led to the opinion that the sea had once filled the St. Lawrence, Lake Ontario, and Lake Champlain. As the deposits in these localities do not in the opinion of the geological party to which he was attached, belong to the true drift, they had proposed for them the name of the Lawrentian deposits, and he hoped the term would be accepted by geologists generally.

Prof. Rogers remarked, that throughout New England, in the river courses and on the St. Lawrence, there are found strata of thin, laminated clays and sands, which had evidently been tranquilly deposited. During a visit to the Green and White Mountains the past summer, he had seen these layers at an elevation of one thousand feet above the sea, following the outline of the country, and containing no marine shells. He thought it improbable that there had been the coincidence of an elevation of these strata with the mountains and ridges where they are found. He thought it more philosophical not to suppose the former existence of the sea beyond the point where marine fossils have been found. As to the strata of the White and Green Mountains, they were not entirely explicable, but they may have been the result of an extensive drainage. The name offered by Mr. Desor, he was very ready to receive as applicable to a local deposit.

Mr. Desor spoke of the well known "Ridge Road" from Rochester to Lewiston.

He said the Ridge Road had been usually regarded as an ancient beach of the Lake. He considered this opinion, however, to be erroneous, as the soil of which it is composed, which is a yellow sand, extends some miles inside of it. He thought it had probably been formed under water in a similar way to the submarine ridges found in the vicinity of Nantucket, and the Oesars which have been described by Brongniart as occurring in the north of Europe.

Mr. Stodder said he did not regard the existence of a sandy soil inside of the ridges of Lake Erie sufficient evidence that they are not old beaches, which he himself believed them to be. Around Chelsea Beach, in Massachusetts, there is a ridge fourteen feet high, through which pebbles seem to have worked their way, just as they are described by Mr. Whittlesey as having done at Lake Erie. Within the outer ridge of Chelsea Beach are two others like terraces. From the existence of the remains of trees, there is evidence of the subsidence of the marsh within at a comparatively recent period.

Mr. Desor replied, that he agreed with Mr. Stodder in the view which he had taken of Chelsea Beach. He thought, however, that the difference of level of the Ridge Road at different places was incompatible with the supposition of its having been a beach. The ridges near Toronto, on the contrary, had been regarded by Mr. Whittlesey as beaches, from the fact of their base line being level..

Mr. Stodder said, that the unequal elevation of different parts of the Ridge Road was not incompatible with the theory of its having been a beach, if it be supposed to have been raised to its present position. The elevation of so extensive a tract to the height of five or six hundred feet could hardly have occurred without producing inequalities at different places, as great as are found, of some thirty or forty feet. If the ridge had been left by the subsidence of Lake Erie, it would probably have been level.

Mr. Wells alluded to the occurrence of *Septaria* on the eastern bank of the Connecticut as an interesting fact in its bearing upon the comparative age of American and European deposits. In England the *Septaria* are characteristic of the lower lias.

Dr. A. A. Gould presented descriptions of sixteen species of *Melania*, which had been regarded as new by Mr. J. G.

Anthony, and which he had described at the request of that gentleman, who was prevented from doing so by disease of the eyes.

MELANIA NUCLEOLA. T. parvâ, solidâ, detruncatâ, subglobosâ vel sub-cylindraceâ, lævi, virescente fasciis duabus saturatoribus cinctâ; anfr. 2 – 3 ventricosis, ultimo demum cylindraceo; aperturâ semilunari, labro anticè dilatato, posticè incrassato; columellâ callo copioso indutâ. Long. ½; lat. ⅜ poll. *Hab.* Tennessee.

Belongs to a group of solid, ellipsoidal species peculiar to the region of Lower Tennessee and Alabama. It has a very sparing development of the spire, and a remarkable flattening about the middle of the last whorl.

MELANIA DENSA. T. solidâ, elongato-ovatâ, acuminatâ, dilutè olivaceâ; spirâ productâ, anfr. 6 – 7 ventricosis, posticè angulatis, supernis minusculis, ultimo sub-cylindraceo ⅔ long. testæ adequante; aperturâ angustè ovatâ, vix effusâ, anticè rotundatâ; columellâ valdè callosâ; fauce livescente. Long. ⅞; lat. ⅜ poll. *Hab.* Maury's Creek, Tennessee.

Somewhat like *M. basalis*, Lea. The shelving of the whorls, towards the suture and the acumination of the spire are among its most striking characters.

MELANIA ABBREVIATA. T. parvâ, ovato-conicâ, turritâ, solidulâ, corneâ, acuminatâ; anfr. 5 tabulatis, ultimo compresso; aperturâ rotundato-ovatâ, contortâ, labro anticè dilatato, posticè latè sinuato. Long. ½; lat. ¼ poll. Inhabits Maury's Creek, Tennessee.

A peculiar shell, though not easily characterized. Its abbreviated form, shouldered whorls, and compression of the last whorl are among its peculiarities.

MELANIA INORNATA. T. modicâ, solidiusculâ, ovato-lanceolatâ, simplici, luteo-virescente posticè saturatiori ad suturam pallidiori; anfr. ad 8 convexis, apicalibus carinatis, ultimo ⅖ long. testæ adequante; aperturâ trientem long. testæ, angustè lunatâ, anticè subacutâ, productâ; columellâ angustâ, anticè callosâ; fauce albidâ. Long. ⅞; lat. $\frac{3}{10}$ poll. Inhabits Lorrain Co., Ohio.

A simple species like *M. simplex* and *M. gracilis.* Its pale sutural region is perhaps its most obvious character.

MELANIA PULCHELLA. T. parvulâ, tenui, elongato-conicâ, fusco-corneâ, fusco fasciatâ ; spirâ conicâ, anfr. 7 – 8 convexiusculis ; aperturâ amplâ, $\frac{1}{3}$ long. testæ, elongato-ovatâ. Long. $\frac{7}{10}$; lat. $\frac{1}{4}$ poll. Inhabits —— ?

A pretty species, ornamented by dark, rather broad bands, somewhat like *M. Taitana* and some varieties of *M. Virginica.*

MELANIA TRACTA. T. ovato-lanceolatâ, gracili, fusco-viridi, longitudinaliter varicoso-plicatâ et filis tenuibus cinctâ ; anfr. 7 convexiusculis ; suturâ profundâ ; aperturâ contortâ, angustâ, ovali, labro anticè producto ; columellâ albâ ; fauce lividâ. Long. $1\frac{1}{8}$; lat. $\frac{3}{8}$ poll. Inhabits Ohio.

General form like *M. Virginica*, but with the whorls more rounded. The delicate raised lines which surround it are among its more obvious characters.

MELANIA BICOLORATA. T. parvâ, exili, fusco-olivaceâ ad suturam flavescente ; anfr. 6 – 7 planiusculis, supernis filis tenuibus cinctis, ultimo anticè gibboso ; aperturâ ovatâ, labro anticè dilatato, posticè sinuato ; fauce livescente. Long. $\frac{7}{8}$; lat. $\frac{1}{4}$ poll. Inhabits Camp Creek, near Madison, Indiana.

An unadorned species, rather remarkable for its elongated, slender form, and well-rounded whorls. It comes near *M. exilis* and *M. terebralis*, having the tip threaded as in those species.

MELANIA BREVISPIRA. T. parvâ, elongatâ, ovatâ, truncatâ, solidulâ, inornatâ, nitidâ, fusco-viridi ad suturam pallidiori ; anfr. 4 – 5 convexis, interdum ad suturam subitò declivibus ; aperturâ ovatâ, labro anticè vix dilatato, posticè sinuato. Long. $\frac{3}{5}$; lat. $\frac{3}{10}$ poll. Inhabits Ohio.

A small, plain species ; with no very obvious distinctive marks. It is allied to *M. plebejus*, but is rather more slender. It is usually much eroded.

MELANIA CORACINA. T. parvâ, tenui, conico-turritâ, piceâ, nitidâ ; anf. 6 – 7, supernis planulatis, longitud. ordinatim costato-plicatis, ultimo ventricoso, sub-angulato ; aperturâ rotundato-

ovatâ, anticè rotundatâ; columellâ angustâ, nigrescente. Long. $\frac{3}{5}$; lat. $\frac{1}{5}$ poll. Inhabits Cany Fork, Tennessee.

The peculiar dark, purplish-black color of this prettily sculptured species is a very decisive character. It is allied to *M. decora* and *M. costulata.*

MELANIA ELATA. T. tenui, gracili, elongatâ, pallidè corneâ ad suturam pallidiori; anfr. 8 – 9 planiusculi, supernis carinatis; aperturâ ovatâ anticè effusâ; columellâ tenui. Long. 1; lat. $\frac{3}{10}$ poll. Inhabits Maumee River, Ohio.

A plain, slender species of an unusually pale color. The whorls vary much in obliquity and convexity. It is similar in many respects to *M. bicolorata.*

MELANIA NAPELLA. T. parvâ, ovatâ, acuminatâ, lævi, dilutè corneâ; anfr. 7, supernis conicis et ad suturam carinatis, antico immodicè ventricoso; aperturâ $\frac{1}{2}$ long. testæ, angustè lunatâ, labro anticè dilatato, posticè haud sinuato. Long. $\frac{1}{2}$; lat. $\frac{1}{4}$ poll. Inhabits Ohio.

A pale, rather singular species, from its bulbous form. Some immature specimens of *M. simplex* are often much like it.

MELANIA CUSPIDATA. T. parvâ, curtâ, ovatâ, acuminatâ, lævi, ex olivaceo purpurascente ad suturam pallidâ; anfr. 6 convexis interdum tabulatis, apicalibus carinatis, ultimo ventricoso; aperturâ amplâ dimidiam longitud. testæ adequante; labro anticè dilatato, posticè vix sinuato. Long. $\frac{3}{5}$; lat. $\frac{3}{10}$ poll. Inhabits Maumee River, Ohio.

Allied to *M. napella*, having the same peculiar bulbous form and produced tip. It is, however, much more elongated. It resembles *M. Warderiana,* Lea.

MELANIA INEMTA. T. elongatâ, turritâ, detruncatâ, inornatâ, fusco-viridi; anfr. 3 – 4 convexiusculis, ultimo gibboso posticè constricto; suturâ impressâ; aperturâ latè lunatâ, vix effusâ, labro fusco. Long. $\frac{3}{4}$; lat. $\frac{3}{8}$ poll. Inhabits Virginia.

Possibly this may be a largely truncated specimen of *M. Virginica*, which it resembles in its aperture. The form of the ultimate whorl is unusual.

MELANIA PLEBEJUS. T. parvâ, solidiusculâ, inornatâ, detruncatâ, ovato-conicâ, rubiginosâ ; anfr. 3 planiusculis, ultimo magno, ventricoso, sub-angulato ; suturâ vix impressâ ; aperturâ amplâ, ovatâ ; labro anticè vix dilatato, posticè haud sinuato ; columellâ incoloratâ vel rufo-tinctâ. Long. $\frac{5}{8}$; lat. $\frac{3}{10}$ poll. Inhabits Saline County, Arkansas.

A small, apparently variable species, without any attractive characters. The angle around the last whorl is more or less marked, or even wanting. Small specimens appear to be much like *M. Nickliniana.*

Melania succinulata. T. elongatâ, acuminatâ, ovato-corneâ, tenui, inornatâ, flavo-corneâ ; anfr. 7 – 10 convexiusculis, apicalibus ad suturam carinatis, ultimo $\frac{2}{3}$ long. testæ, anticè subattenuatâ ; aperturâ angustâ, ovatâ, contortâ, anticè sub-dilatatâ. Long. $\frac{5}{8}$; lat. $\frac{1}{4}$ poll. Inhabits Ohio.

A smooth, delicate species, much thinner than usual, and when well cleaned nearly as transparent and amber-colored as a *Succinea.* It may be compared with *M. clavæformis.*

Melania robulina. T. solidâ, ovato-rhomboideâ, corneâ fasciis fuscis cinctâ ; anfr. 6, series duos nodulorum gerentibus, anticâ ad suturam immersâ ; aperturâ rhomboideâ anticè in rostrum productâ, posticè callo munitâ. Long. 1 ; lat. $\frac{5}{8}$ poll. Inhabits Cumberland River, Tennessee.

Of the same size as *M. armigera*, Say, but differs in coloration ; the rostrum is much longer, and the posterior series of tubercles much more developed.

The Secretary presented, in the name of Mr. Charles Girard, observations upon Planarian Worms, with descriptions of several new species of Echinoderms.

Having had lately an opportunity of examining a large number of *Vortex Warrenii*, a marine planaria, and of investigating some points of its organization, I have observed a fact to which I would call the attention of the Society. I found within the body living young, larvæ, the form of which very much resembled that of the full grown animal, with the single difference that the anterior extremity was less obtuse. There were as yet no traces of eye specs. The whole body of these larvæ appeared to be composed of cellular substance, and was surrounded by vibratory cilia. Acentral transparent channel, probably the alimentary tube under its most simple form, was seen extending the whole length of the body.

This is the first example that I know of, among marine planariæ, of a species bringing forth living young. We have in this vicinity, *Planaria gracilis* Hald. (*Phagocata gracilis*, Leidy,) a fresh water type, in which the same phenomenon of generation is observed. The organization of Planariæ in general, and of these two types in particular, which I am now tracing, will contribute to elucidate the doubtful questions of their physiology and their embryology.

The first three species of the following *Echinoderms*, (two of which, constituting two new genera, are described hereafter,) belong to the group of true *Echini*, the fourth to *Echinometri*, the fifth to *Clypeastri*, and the sixth to *Spatangi*.

Genus HELIECHINUS Girard.

This genus is characterized by having both the ambulacral and interambulacral spaces of the same width. The pores of the ambulacra are disposed in pairs in three vertical series, the inner one irregular, and interspersed with tubercles of the third magnitude. The tubercles themselves are neither perforated nor crenated, and are a little larger on the interambulacral spaces. The mouth is small and notched. The auricles are distant, and the two pillars united at their summit. It differs from *Amblypneustes* by the absence of holes at the angles of the plates and by the presence of notches at the circumference of the mouth ; — from *Holopneustes* by having the ambulacral spaces equal, if they do not surpass, in width, the interambulacral spaces, and by narrower zones of pores. This genus represents, in our epoch, the extinct group of *Echinopsis*, from which it differs by the imperforate condition of its tubercles, and by the arrangement of the pores in the ambulacra. There are two types among *Echinopsis*, a cretaceous and a tertiary type. The first and oldest has a single and vertical pair of pores, whilst the other possesses three oblique pairs. Should the arrangement of the pores prove not to be of generic value, my genus *Helie-*

chinus, of course, must be combined with *Echinopsis* unless perforate and imperforate tubercles may constitute a sufficient character for the discrimination of the genera.

Of this living type I know but one species which belongs to the Cabinet of the Society. It was found at Key West, (Florida.) It is:

1. H. Gouldii Girard. General form, nearly circular; lower surface slightly concave around the mouth; upper surface rather depressed than conical. The tubercles are but little prominent, the larger ones, distant from each other, form a double row in the ambulacral spaces. In the intermediate space between the larger tubercles as well as between the pores, there are a few smaller tubercles without regular arrangement. The tubercles of the interambulacral spaces are disposed in three double rows, of which only one reaches the summit. The outer row is rather diffuse and composed of tubercles of a smaller size, resembling those which are scattered between the rows. The spines are short and slender, the longest three eighths of an inch in length. All of them are cylindrical, varying in size according to the size of the tubercles themselves. The plates are covered with a minute granulation. The extremities of the teeth are very acute.

Genus Melebosis Girard.

This genus is intermediate between *Salmacis* and *Temnopleurus*, but differs from the first in having the ambulacral pores disposed in three oblique pairs, and from the latter by the want of deep impressions at the union of the plates where small holes only are seen, as in *Salmacis*. The tubercles are slightly crenated but not perforated. The auricles, or support of the masticating apparatus, are thin, elevated, contiguous, forming a beautiful crown.

2. M. mirabilis Girard. Species measuring over one inch and a half in horizontal diameter. General form, hemispherical; inferior surface nearly plane. Tubercles of equal size on both ambulacral and interambulacral spaces, but sensibly larger on the inferior surface. The plates of the ambulacra are narrower than those of the interambulacra, and there is a large tubercle on each. The tubercles of the ambulacral spaces are more numerous than the others. The mouth is slightly notched. The

anal and sexual plates and spines are not preserved in our specimen.

The origin of this species is not precisely ascertained. I found its fragments among East Indian shells, and reconstructed the specimen which I have placed in the cabinet of the Society.

3. Psammechinus asteroides Girard. The external series of tubercles of the interambulacral spaces are much larger than others and form a prominent star-like figure which constitutes the chief character of this species. Its general form is circular and very depressed. From New Zealand. It belongs to the cabinet of the Society. Another species of the same genus, but smaller and spheroidal and not yet described, was found on the shores of that Island by Quoy and Gaimard in 1829; so that there are two species of true Echini to be added to the New Zealand fauna. Hitherto only two species of Heliocidaris, one of Laganum and one of Echinoneus were on record.

4. Echinometra nigrina Girard. Small species, subovate, very much depressed, nearly flat above. The interambulacral spaces have twice the width of the ambulacral. There are five or six pairs of pores in the ambulacra. The tubercles in the ambulacral spaces are smaller than those of the interambulacral, and form only a double very close series. In the interambulacral spaces there is also a double series of tubercles running from the periphery of the mouth to the apex of the disc, but there exists in addition on each side an outer series of smaller tubercles which does not reach the summit. Along the middle line of the ambulacra there also exists a double but indistinct series on account of the small space left by the principal series. The surface of the whole body, not occupied by the tubercles in series, is covered with still smaller tubercles, which extend even to the sexual and eye plates. The madreporic body is large and heart-shaped. The mouth is proportionally large and circular, slightly notched. The auricles are rather thin; their pillars are oblique and united at their summit, where a notch exists at the point of union. A sharp and low ridge runs from one auricle to the other, thus connecting these parts at their base. The spines are long, cylindrical, slender, very acute at their extremity and longitudinally striated or furrowed. The longest ones measure about an inch. From Cape Palmas, West-

ern Africa. Sent to the Cabinet of the Society by Dr. G. A. Perkins. The color of the body and spines is uniformly bluish black above; a little lighter below.

Observations. Having opened one specimen preserved in alcohol, the following peculiarities were noticed. The lantern (of Aristotle) nearly reaches the superior roof of the disc. The auricles form an arch over the zones of pores thus corresponding to the ambulacral spaces. The pyramids of the lantern alternate between the auricles and correspond to the interambulacral spaces. Each auricle sends two powerful muscles to the point of the pyramids but in such a manner, that one pyramid receives its two muscles from two auricles. The other muscles, moving the pyramids, and pieces of the lantern are attached to the auricular and interambulacral ridge. The intestine is wound once around the lantern, and reaches the anus at the same place where the œsophagus passes over the lantern. Its course is undulated, descending and ascending. From the top of the lantern it descends between two auricles, and forms a winding on the interambulacral space, where it ascends and passes inside the auricle over its muscles and descends again on the opposite side, and so on for the five principal segments of the body. The intestine is suspended at the inner wall by means of delicate ligaments. The ovaries rest on the interambulacral windings of the intestine, and are contiguous near the summit. There is left a free and well defined space, corresponding to the ambulacra, for the circulation of the water which enters through the pores. The fluid passes under the arch of the auricles, soaks the masticating apparatus whence the current may empty through the mouth. The water might also enter the mouth, and passing under the auricular arch, fill up the whole cavity of the animal.

5. ECHINOCYAMUS MINIMUS Girard. The smallest species hitherto known of this genus, the largest specimen I have seen being only a sixth of an inch in longitudinal diameter. Its general form is that of an ellipse posteriorly attenuated. The upper surface is depressed, nearly plane; the inferior surface is slightly concave. The mouth is proportionally large; the anus is nearer the posterior margin than to the mouth.

Found within a *Spatangus meridionalis* from the Mediterranean. This species is alluded to in Prof. Agassiz's "Monographie des Scutelles." The author had a specimen which was lost before any description could be made.

6. SCHIZASTER LACHESIS Girard.—*Sch. atropos* RAVEN E. L. Echin. recent and foss. of S. Carolina, 1848, p. 4. The most prominent characters which distinguish this species from *Sch. atropos* of Lamarck are its general form, which is elongated ovoid, instead of being circular, elevated instead of being depressed, and much narrower, especially on the posterior region. The ambulacra are longer and deeper; the posterior ones slightly arched. The depression under the anus is narrower and does not extend to the inferior surface, the middle line of which is very convex. The tubercles are a little smaller, whence the inference that the spines must be slender. Numerous specimens of this species were collected by Mr. J. Bartlett, who took them on the Texan shores of the Gulf of Mexico.

The origin of Lamarck's *Sch. atropos* is unknown. In the "Encyclopédie Méthodique," it is said to have been found on the French shores of the British Channel, but as it has never been seen since in these latitudes, there is a reasonable doubt of its occurrence there.

A note was read from Dr. William Read, resigning the office which he had held for the past two years and a half, of Curator of Conchology.

On motion of the Secretary it was voted that the hearty thanks of this Society be presented to Dr. Read for his valuable and efficient services as Curator of Conchology.

Dr. J. M. Warren presented a specimen of Brain Coral from the North Pacific, nearly five feet in circumference. He quoted Ehrenberg and Dana as authorities for saying that such a specimen must have required centuries to attain to its present size.

An ivory cane, encrusted with a calcareous deposit, which had been drawn up from the channel near Charlestown bridge, was presented to the Society in the name of Mr. George Edwards. The thanks of the Society were voted for the donation.

A specimen of *Colymbus arcticus*, Black-throated Diver, was presented in the name of Mr. Theodore Lyman.

December 4, 1850.

The President in the Chair.

Present, thirty-six members.

The President exhibited to the Society the remaining portion of the recent donation of casts of Himalaya fossils, and pointed out their various interesting characters. He also furnished a complete list of the Collection, as follows: —

Dinotherium Indicum,	Part of lower jaw,	Perim Island.
" "	Vertebra,	"
Elephas insignis,	Cranium,	Sivalik Hills.
" planifrons,	Grinder,	"
" nomadicus,	"	Nerbudda.
"	First vertebra,	Sivalik Hills.
" Cliftii,	Grinder,	Ava.
Mastodon perimensis,	Cranium,	Perim Island.
" "	Grinder of lower jaw,	"
" Sivalensis,	Part of cranium,	Sivalik Hills.
" "	Grinders,	"
" latidens,	Grinder, &c.	"
Hippopotamus palæindicus,	Part of lower jaw,	Near Nerbudda.
" Sivalensis,	Cranium,	Sivalik Hills.
" "	Lower jaw,	"
" palæindicus,	Cranium,	"
Rhinoceros "	"	"
Sus giganteus,	"	"
Equus nomadicus,	"	Nerbudda.
" Sivalensis,	"	Sivalik Hills.
" "	Lower jaw,	"
Sivatherium giganteum,	Cranium,	"
" "	Horn,	"
" "	Cranium,	"
Mastodon angustidens,	Grinder,	"
" latidens,	"	"
" longirostris,	"	"
Merycopotamus dissimilis,	Cranium,	"
" "	Lower jaw,	"
" "	Humerus,	"
Chalicotherium Sivalense,	Upper jaw, (part of)	"
" "	Lower jaw, "	"
Hippohyus Sivalensis,	Cranium,	"
Equus "	Part of cranium,	"

Equus,	Vertebra,	Sivalik Hills.
Hippotherium Antilopinum,	Part of lower jaw,	"
Sivatherium giganteum,	Tarsal bones,	"
Camelopardalis affinis,	Vertebra,	"
Capra,	Cranium, (part of)	"
Sivatherium giganteum,	Vertebra	"
" "	Fragment of jaw,	"
" "	" femur,	"
" "	Anterior extremities,	"
Camelus Sivalensis,	Cranium,	"
Camelopardalis,	Humerus,	"
Bos,	Cranium,	Nerbudda.
"	" and horns	"
Ursus Sivalensis,	"	Sivalik Hills.
" "	Femur,	"
Emys Hamiltonoides,		"
"		"
Colossochelys Atlas,	Humerus,	"
" "	Episternum,	"
Leptorhynchus giganteus,	Muzzle,	"
" gangeticus,	Cranium, (part of)	"
" "	" "	"
Crocodilus biporcatus,	Part of Cranium,	"
Capra,	" "	"
Felis palæotigris,	Cranium,	"
" cristata,	"	"
Canis,	"	"
"	"	"
Hyæna,	"	"
"	"	"
Ursus Sivalensis,	Lower jaw,	"
Enhydriodon ferox,	Cranium,	"
" "	"	"
" "	"	"
Machairodus Sivalensis,	" fragment,	"
" "	" "	"
Simia,	Lower jaw, (part of)	"
Aves. family, Struthionidæ,	Fragment of Tibia,	"
Pisces. family, Siluridæ,	Fragment,	"
Lutra palæindica,	Cranium,	"
Colossochelys Atlas,	"	"
Crocodilus biporcatus,	" (part of)	"
Rhinoceros platyrhinus,	Cranium,	"

Dr. Gould presented, in behalf of Professors W. H. Harvey of Trinity College, Dublin, and J. W. Bailey of West Point, descriptions of seventeen new species of Algæ,

collected by the United States Exploring Expedition, as follows: —

NOTHEIA, Nov. Gen. Fucoidearum.

Frons (parasitica) filiformis, prolifera, solida. *Scaphidia* per totam frondem sparsa, in strato corticali infra superficiem excavata, sphærica, cum ostioli superficiali per canalem communicantia. *Sporæ* inter perisporium hyalinum lineari-obovatum parietali nidulantur. *Paranemata* simplicia.

Alga parasitica, pusilla, organis nullis discretis, quasi receptaculis Cystoselræ vel Sargassi habitu referens.

1. *Notheia anomala.* Harv. et Bail.

Bay of Islands, New Zealand, parasitical on *Hormoseira Sieberi.*

2. *Dasya* (Stichocarpus) *plumosa* H. et B., fronde inarticulatâ compressâ ancipite bi-tripinnata, pinnis elongatis, pinnulisque brevibus alternis, ramellis monosiphoniis distichiis, crebris, sæpius oppositis strictis simplicibus vel furcatis, axillis angustiformis, articulis ramellorum cylindricis, diametro triplo longioribus. *Hab.* Puget Sound, N. W. America.

3. *Rhodomenia Wilkesii* H. et B., stipite brevi cartilaginea compressa mox cuneato-plana et in laminam 1 – 3 pedalem lato-lanceolatam sub-indivisam membranaceam sanguineo-albescentem, explanata, coccidiis numerosissimis per frondem densissime sparsis. *Hab.* Straits of St. John de Fuca, N. W. America. A fine species having the habit of an Iridæa; the fruit of a Kallymenia, and the structure of Rhodomenia.

4. *Hypriea Coulteri*, Harv., radice fibrosa, caule erecto basi attenuato sursum incrassato simplici ramos alternos emittente, ramis basi alternatis incrassatis vermicularibus nunc nudis nunc alterne ramulosis patentibus, coccidiis conicis numerosis per ramos sparsis. Harv. in Smith. Mem. ined. *Hab.* California, Dr. Coulter; Puget Sound, Ex. Exped.

5. *Gigartina* (Mastocarpus) *exasperata* H. et B., frondis stipite mox in laminam coriaceo-membranaceam bi-tripedalem latè lanceolatam integram dilatata, margine incrassato eroso-

dentato et appendiculato, disco utrinque spinulis simplicibus ramosisve dense consperso, coccidiis pedicellatis in spinulis marginalibus et e disco ortis immersis. *Hab.* Opposite Fort Nisqually, Puget Sound.

6. *Gigartina mollis* H. et B.; fronde cartilaginea plano-compressa lineari disticha pinnatim ramosa purpurea, ramis ramulisque alternis vel oppositis erectis basi angulatis attenuatis integris vel denticulatis apice pinnatis, ramulis ultimis angustis subfiliformibus. *Hab.* Puget Sound.

7. *Nostoc expansum* H. et B., terreste (?) phycomate expanso irregulariter lobato, prasino-viridi; trichomatibus externis arctissime intricatis densissimis, internis laxe implicatis flexuosis dilute ærugineis; articulis sphæricis vel ellipticis. Spermatiis sphæricis. *Hab.* Puget Sound.

8. *Ectocarpus hamulosus* H. et B., cæspite brevi, densissime implicato, filis implexis curvatis vage ramosis, ramis horizontalibus refractisque secundis vel alternis, ramulis hamatis simplicibus v. furcatis patentissimis sparsis, articulis diametro duplo vel triplo longioribus, sporis sphæricis vel ovalibus ramulos terminantibus (i. e. pedicellatis.) *Hab.* St. Jago, Cape de Verds.

9. *Chondrus uncialis* H. et B., fronde unciali stipitata sursum flabelliformi angustissima plano-compressa multoties dichotoma fastigiata, axillis patentibus, apicibus bifidis. *Hab.* St. Jago, Cape de Verds.

10. *Gracilaria filiformis* H. et B., fronde spithamæa filiformi gracili e basi dichotoma pluries divisa, ramis flexuosis, axillis obtusis, apicibus acutis vel subulatis, ramulis lateralibus vix ullis. *Hab.* Diamond Hill, Oahu.

11. *Gymnogongrus ? dendroides*, H. et B., crassus, stipitatus; stipite elongato apice in ramos crebre dichotomos vel irregulares soluto, ramis nunc pluries furcatis, nunc vage ramosis flexuosis ramulis lateralibus filiformibus onustis, axillis rotundatis, apicibus obtusis, ramis fructiferis nodosis favellidia numerosa foventibus. *Hab.* Cook's Rock and Byron's Bay, Hawaii; also from Chili.

12. *Gelidium unilaterale*, H. et B., fronde lineari angusta compressa ramosa, ramis arcuatis plerumque secundis patentibus, ramulis secundis horizontalibus obtusis filiformibus. *Hab.* Tahiti.

13. *Liagora hirta* H. et B., subcalcarea vage ramosa; ramis alternis v. oppositis elongatis attenuatis simplicibus vel furcatis velutino-hirtis purpureis, ramulis lateralibus paucis filiformibus. *Hab.* Navigators' Islands.

14. *Caulerpa falcifolia*, H. et B., caule repente glabro, ramis erectis simplicibus v. furcatis foliosis, foliis densissimis undique insertis imbricatis falcatis compressis mucronatis. *Hab.* Tongataboo.

15. *Caulerpa Pickeringii*, H. et B., caule prostrato, spongioso foliis densissime vestito per totam longitudinem radicante, ramis erectis brevibus mammillæ-formibus spongiosis foliosis, foliis verticillatis creberrimis horizontalibus pluries dichotomis segmentis fastigiatis apicibusque furcatis vel bimucronulatis. *Hab.* Wilson's Island, Paumotu Group.

We have great pleasure in affixing to this remarkable plant the name of Dr. Pickering, who collected many of the Algæ here described, and whose ethnological writings are so well known and appreciated.

16. *Dictyota bidentata*, H. et B., fronde basi vix stuposa cuneata pluries dichotoma, segmentis sursum latioribus, sinubus rotundatis, apicibus junioribus acute bidentatis, areolis rectangularibus, soris minutissimis per totam paginam frondis sparsis. *Hab.* Mindanao.

CHLORODESMIS, Nov. Gen. Siphonearum Vauchericæ. *Gen. Char.* Stipes spongiosus, e filis tenuissimis membranaceis densissime intertextis compositus, apice in fila libera penicillata desinens. *Fila* penicillata membranacea continua dichotoma, libera, ad axillas constricta, pseudo-articulata; articulis succo viridi repletis.

17. *Chlorodesmis comosa*, H. et B., *Hab.* Feejee Islands.

A curious plant, with the habit of a Penicillus, but not in the least calcareous.

Mr. Perley, present by invitation, made some statements in relation to the fisheries of the Bay of Fundy.

During the past three months he had been officially engaged in examining those fisheries.

He had found that the staple fish of the Bay of Fundy is the Hake, *Gadus carbonarius.* It is a singular fact that, although so numerous there, he had never seen one in the Gulf of St. Lawrence, or met with a fisherman who had seen one in that locality. The fish next in importance, in the Bay of Fundy, is the Shad, *Alosa vulgaris.* These fish, after traversing the Atlantic coast, arrive in great numbers in the Bay and proceed at once up the rivers to spawn; where they remain but a short time, continuing on to the head of the Bay, to feed on a marine worm, which is very abundant on the mud flats. A second run of fish which do not spawn, follows the first, and arrives in a much fatter condition. The Cod fishery is only good at the mouth of the Bay, where the depth of water is about sixty fathoms. Here the Cod are taken of great size, averaging fourteen to the quintal.

Mr. Perley also made some statements with regard to the existence of fossil trees, &c. in the coal mines at the Joggings, Cumberland Bay. They have been found in this locality in great numbers. He presented specimens of fossils from the shores of the Bay of Fundy, Specular Iron ore from the neighborhood of the Harbor of St. Johns, White Marble, cubes of which had been quarried six feet in diameter, and which it was thought might answer for statuary purposes, from the head of the Bay of Fundy; Alabaster from the same vicinity; Carbonate of Copper from the Five Islands, and Barytes.

In reply to a question from Mr. J. E. Cabot relative to the alleged subsidence of the shore of Newfoundland, Mr. Perley replied, that it is a well known fact, that the harbors on the south and east side of Newfoundland are deepening, while on the northern shore they are growing shallow; harbors which twenty years ago were deep enough for large vessels now hardly admitting shallops. On the south side of the Island of Grand

Menan there was formerly a marsh covered with trees, which were cut down by persons yet living. The marsh has sunk so much that the stumps of those trees are eight or nine feet under water at low tide.

Mr. Desor quoted, from recollection, a statement in Poggindorff's Annalen for 1849, that the shores of Newfoundland are undergoing the process of elevation. It was interesting to learn that a corresponding process of depression is going on, as it would give confirmation to Darwin's and Dana's views with regard to the changes of level in the Pacific, they having stated that a rise in one place is always attended by a subsidence in another. Mr. Desor also referred to a statement which had been made formerly by Dr. C. T. Jackson, that the inhabitants on the coast of Maine believe the rocks on the sea shore to be growing.

Mr. J. E. Cabot translated to the Society the passage from Poggendorff's Annalen, where it is quoted from the Newfoundland Times, stating that the land near Conception Bay is rising.

Prof. Wyman remarked, that while on a visit, during the summer of 1849, to Labrador, he had noticed on the shores of Great Mecatina, shingle, pebbles, and rounded stones for a long distance, far above high water mark. He also noticed rounded " heads " of rocks thirty or forty feet above the highest drift weed, and which had all the appearances of having been acted upon by the surf. He had noticed the same appearances at Bras d'Or and Red Bay. At Red Bay he saw a large accumulation of the remains of whales in a similar position. It is not known whether they were carried there or washed up by the tide. If by the latter cause, the shore must have been much lower than it now is. Many of them are so bulky as to make it improbable that they were transported by hand. They are covered with moss and bear marks of great age. None of the inhabitants in the vicinity are acquainted with their history. It is possible that they are the remains of whales captured by the Royal Fishing Company of Miscoe in the seventeenth century.

The President referred to the elevation in modern times of large tracts of the coasts of Norway and Chili. He thought that accurate observations should be made on our own coast by means of fixed marks set up for the purpose.

Mr. J. H. Abbot stated, that in 1849 a memorial had been addressed to the department of the Coast Survey at Washington by the American Academy of Arts and Sciences, requesting that such marks might be set up and observations made; and that in compliance with this request orders had been given to this effect.

Mr. Desor made some remarks on the Swamps bordering the western rivers.

The banks of the western rivers, particularly those emptying into Green Bay, are bordered by a belt of trees, seldom more than two miles in width, beyond which are generally extensive swamps. The trees in this region are mostly White and Yellow Pines, which are probably enabled to grow in this situation, from the drainage of the river banks. On the Ministick, a shallow river flowing into Lake Michigan on the northern shore, above a point fifty miles from its mouth, the banks are of sand, covered with a pine forest. This drift deposit is in one place forty feet thick, with a bed of clay beneath, ten feet thick. The river bank descends towards the land by a slope of 15°, to a swamp which is within one hundred rods of the river, and at a higher level. It is difficult to understand how the water is retained in this position in opposition to the common law of percolation. Mr. Whittlesey has suggested that a thick bed of leaves in the swamp may have some effect in preventing the drainage of its waters.

Mr. Alger called the attention of the Society to the recent discovery in New Jersey of a valuable and extensive deposit of massive phosphorite.

It occurs in the town of Hurdsville, Morris County, New Jersey, a few miles from the Morris Canal. It is associated with magnetic iron pyrites, and rarely with copper pyrites, altogether forming a vein of about eight feet in width, traversing a gneiss or hornblendish rock. These metallic sulphurets occupy the lowest part of the vein, but are often penetrated by the outer crystallization of the phosphorite, which is sometimes met with in very regular prisms of the usual hexahedral form and several inches in length, entirely surrounded by the metallic gangue. The superincumbent portion of the vein, of about five feet thickness, is composed entirely of the massive and semi-crystalline phosphate, and it follows the lower portion with a pretty uniform dip and parallelism to the depth of about thirty feet, as far as it has been explored. It extends to the surface of the ground, and was opened for the purpose of obtaining pyrites for the manufacture of copperas, or green vitriol, which it was thought would pay the cost of mining, while the phosphate of lime was overlooked, or supposed to be some common rock, though the occurrence of a few crystals of the mineral imbedded in the pyrites had been known for some time, and had attracted various mineralogists to the spot. There may be seen a single crystal at the residence of Governor Dickinson, which must have been more than eighteen inches in length. The massive phosphorite was discovered by Dr. C. T. Jackson and Mr. Alger while on an excursion into New Jersey during the past summer. Several tons of it have been removed, and its value is soon to be tested as a substitute for animal phosphate and guano, as an agricultural fertilizer, after being ground, and undergoing other suitable preparations to render it most readily solvent and active in the soil. So important is this substance deemed, that a few years since the British Government sent commissioners to Estremadura, in Spain, for the purpose of exporting it to England, and Prof. Daubeny made a report on the subject, the result of which was, that it did not occur in sufficient quantity, so that the only mineral phosphate now used by the agriculturalists in England is obtained from the *crag* on the coast of Suffolk. But this is very impure, containing carbonate of lime and other earthy matter, which Prof. Johnstone says are objectionable in several ways, while the massive phosphate of New Jersey is perfectly pure. Prepared bone dust, however, is very largely used in England, and in this country the demand for it is considerable. This prepared bone contains several soluble phosphates besides lime, as magnesia and soda, all of which are important to the growth of plants. When we consider the bearing of phosphate of lime upon the animal and vegetable economy, and that our own bones and teeth are so largely composed of it and *derive it*, *as they only can*, from the vegetable kingdom, we see how important it is that the soil which is to afford us our food should be supplied with it as it is taken up by the growing plants. Farms often become valueless from the failing supply of phosphates, the crops fail, and the cattle raised upon them are of a less hardy class. The ash of wheat, rye, corn, beans, turnips, and potatoes, contains from fifty to eighty per cent. of various phosphates.

Mr. Alger, in conclusion, presented to the Cabinet of the Society specimens of this mineral both in crystals, and as associated with the sulphates of iron and copper.

Mr. Alger also made some observations on the economic value of Peat.

The following products have been recently obtained from it in England, namely,—Carbon; Sulphate of Ammonia, worth £12 per ton; Naphtha, worth five shillings per gallon; Paraffine, a fatty, inodorous substance, of which candles may be made, worth one shilling per pound; Volatile and Fixed Oil, worth one shilling per gallon. It is a bicarburet of hydrogen, and has the same composition as Olefiant gas.

The Committee appointed at the last meeting to nominate a candidate for the office of Curator of Conchology, made vacant by the resignation of Dr. Read, reported the name of Mr. William Stimpson, who was in accordance with the nomination unanimously elected to the office.

Dr. Cabot announced, in behalf of Mr. Francis Brown, the donation of a young Ger Falcon, a very rare and valuable specimen, procured by him in Newfoundland. The thanks of the Society were voted for the donation.

Twenty-six bird skins were presented in the name of Mr. Algernon Coolidge, a member of the Society.

Dr. Gould presented, in behalf of Dr. Jay of New York, a copy of the Catalogue of the shells in his Cabinet; also a copy of his own memoir of Dr. Amos Binney.

The President announced the donation from Prof. Owen of his Memoir on the Teeth of Placochærus.

December 18, 1850.

Dr. D. H. Storer, Vice-President, in the Chair.

Present, thirty-one members.

Dr. T. M. Brewer read a paper on the habits of some American birds, as observed by him during a visit to New Brunswick and Nova Scotia, in June, 1850. Referred to the Publishing Committee.

Mr. Wells stated, that a vein of Phosphate of Lime exists near Crown Point, New York. It was discovered during the Geological Survey of that State, but had been only recently worked.

The vein had been traced for thirty or forty rods, and it had been opened continuously for thirty feet. In some places it is six feet in width, varying from two to six feet. Thirty tons of it have already been raised, and it is purposed to grind it for agricultural purposes. The vein occurs in gneiss, associated with a primary limestone and a green stone dike, which also contains phosphoric acid. Direction of the vein nearly east and west; dip, north, at a high angle.

The chemical composition of the mineral is as follows: —

Phosphate of Lime,	92.85
Oxide of Iron and Allumeria,	5.20
Silica,	0.50
Water,	1.50
Fluoric acid, a trace.	

In color it is dull and opaque, of a dirty green; hardness, 4; Specific gravity, 3.06.

The discovery of this and the New Jersey deposit would seem to controvert the notion of some geologists, that the Phosphoric acid in the primary rocks is derived from organic remains.

Mr. Alger remarked, that the presence of 5 per cent. of oxide of iron in the New York Phosphate makes it less valuable for the manufacture of crockery ware.

Mr. Desor read a paper on the Parallelism of Mountain Chains in America, as follows: —

It is generally admitted that the Appalachian or Alleghany chain was raised during the deposition of the Coal formation. It is consequently referred by Mr. Beaumont to his system of the Balloons, the direction of which (E. 16° S.), when transferred to Washington, becomes E. 43° 18′ N., a direction which indeed answers pretty accurately to that of the main portion of the Alleghany chain. This is also, according to Dr. C. T. Jackson, the main direction of the hills of New Hampshire and Maine. But there is besides in the Alleghanies another direction more nearly parallel to the meridian, which Professor Rogers considers as a mere deviation from the main direction, whereas Mr. Beaumont refers it to a previous upheaval, together with those ranges of hills in Massachusetts which Prof. Hitchcock has designated as the "oldest meridional system," and whose direction is a few degrees east of north. According to Mr. Beaumont, this latter system would not only be older than the Alleghanies, but even older than the oldest Silurian strata of North America, since it is supposed to have originated previous to the Taconic system.

Now to this system is ascribed a most conspicuous part in the constitution of the soil, not only of New England but of the whole continent, so that if true it must be of paramount importance. From Massachusetts, Mr. Beaumont traces it in a south, southwest direction to the mouth of the Connecticut, and in the opposite direction across New Hampshire and the White Mountains to the sources of the Connecticut, from whence it extends across Labrador to Cape Chisley; nor is it supposed to stop here, for Mr. Beaumont follows it even beyond Davis' Strait into Greenland. The range is said to be not less extensive in the southern direction. Representing it as a great circle, starting from Amherst College in a direction south 15°, he supposes it to run parallel to the general direction of the coast of the United States from the mouth of the Hudson to Cape Hatteras. From thence it is supposed to cross the eastern portion of Cuba, the Isthmus of Panama, and then to touch Cape Guyaquil, passing a litle outside of the Coast of Choco, in a direction parallel to the principal mountain chains of New Grenada.

This system, thus laid down, is considered by Mr. Beaumont as one of the most remarkable mineralogical and metalliferous zones of the globe, including all the localities whence are derived the remarkable minerals of Greenland and Labrador, the gold mines of Vermont, Virginia, North and South Carolina, Georgia, the several gold mines of Cuba, the gold and platina mines of Hayti, and the gold and platina mines of Choco and the Eastern Cordilleras in New Grenada.

If we now ask for the reason why this immense belt should be so much older than any other mountain chain of this Continent, we are referred to the single statement, that in New Hampshire and Vermont the primary rocks following this direction are overlaid unconformably by the strata of the Taconic system. And since the Taconic system is supposed by Mr. Beaumont to be older than the oldest Silurian, the inference on his part was but natural, that the ridges of New Hampshire, Vermont, and Massachusetts must indeed be very old. They were thus made the point of departure of this vast system, to which most of the above-mentioned localities were added merely on account of their direction or of the minerals which they contain.

Now that serious doubts are entertained as to the existence of a Taconic system in New England, especially since it has been proved by the investigations of the geologists of Canada that the slates of the Green Mountains, which were referred to the Taconic, belong in reality to the Silurian formation, the theory of Mr. Beaumont cannot longer be relied upon, being thus deprived of its principal basis. If it is once admitted that the Green Mountains are not Taconic but Silurian rocks, there is no reason why we should not refer them simply to the age of the Alleghanies, the more so as we have direct evidence in the raised conglomerates of Massachusetts, that at least some of the ridges of New England are not of an earlier age than the coal formation.

How far this reasoning might apply to the many other regions connected by Mr. Beaumont with this supposed oldest Meridional system, Mr. Desor was unable to say, but observed, that with all due regard for the great abilities of his illustrious teacher, he thought there was no sufficient reason for upholding any longer this peculiar system, unless it be established on better proofs.

In removing thus this so called oldest Meridional system from its prominent place, it is not a little interesting to notice that those ranges of hills and mountains which are actually known to have been raised previous to the deposition of the oldest fossiliferous rocks, such as the primitive mountain ranges on the north bank of the St. Lawrence, the granite ranges of Lake Superior, and the iron bearing old slates of that country are all more or less parallel to the equator. It would seem as if in these early times, there had been a prevailing disposition on the part of the earth crust to wrinkle in that direction. (We take it for granted that these old hills are the result of a shrinkage in consequence of the cooling of the earth's surface rather than a positive upheaval.) It is only at a later period that we meet with wrinkles running in the opposite direction (north and south.)

Mr. Alger said, that the gold found in Vermont, which he supposed was the authority for M. De Beaumont's allusion to the gold mines of that State, had proved to be of artificial origin. It was gold which had been thrown into a stream forty or fifty years since by counterfeiters, who were suddenly disturbed in their counterfeiting operations.

Dr. Cabot exhibited as part of the donation of Mr. Algernon Coolidge, the following birds, namely: *Paradisea regia*, *P. sexipennis*, *P. superba*, and *Epimachus alba*. He also announced the donation from Mr. Theodore Lyman, of a specimen of Red-throated Loon, *Colymbus septentrionalis*, in a peculiar state of plumage. The white on the side of the head was more extensive than usual, and the back differed somewhat from common specimens. It was also larger than the *septentrionalis* usually is. Dr. Cabot thought it not impossible that two species had been confounded under the same name. He likewise announced the donation of several valuable ornithological specimens from Florida, from Dr. Henry Bryant, a member of the Society. He also presented in the name of Mr. Elliot Torrey a specimen of wood perforated in every direction by white ants. The thanks of the Society were voted for the donation.

A Porcupine was presented in the name of Mr. C. W. Bellows of Pepperell, Mass. The thanks of the Society were voted for the donation.

On motion of M. Bouvé, it was voted, that the thanks of the Society be presented to Mr. Perley of New Brunswick, for his recent donation of minerals and fossils.

Mr. Henry D. Thoreau of Concord, Mass. was elected a Corresponding member.

BOOKS ADDED TO THE LIBRARY DURING THE QUARTER ENDING DECEMBER 31.

Journal de Conchyliologie. No 1. 8vo. Pamph. Paris, 1850. *Exchange.*

Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie de Lyon. Tomes X. et XI. Années, 1847–8. 8vo. Lyons. *Exchange.*

Annales de la Société Linnéene de Lyon. Années 1847–9. 8vo. Lyons, 1850. *Exchange.*

Mémoires de l'Academie des Sciences, Belles Lettres, et Arts de Lyon. Classe des Lettres: Tomes 1, 2. Classe des Sciences: Tomes 1, 2. 8vo. Lyons, 1848–50.

Address before the American Medical Association. By John C. Warren, M. D. 8vo. Boston, 1850. *From the Author.*

Annales de la Société Entomologique de France. Tomes 1–17. 1832–48. 8vo. Paris.

Annual Message of the President of the United States, with accompanying Documents. Vol. 3d. 8vo. Washington, 1850. *From R. C. Winthrop.*

Contributions to the Natural History of the Acalephæ of North America. 4to. Pamph. Boston, 1850. By Prof. Louis Agassiz. *From the Author.*

Classification of Insects, from Embryological data. By Prof.

Louis Agassiz. 4to. Pamph. Cambridge, 1850. *From the Author.*

Descriptions of some American Annelida abranchia. By Joseph Leidy, M. D. 4to. Pamph. Philadelphia, 1850. *From the Author.*

Proceedings of the Academy of Natural Sciences. Vol. V. Nos. 3, 4. pp. 53–79. Philadelphia, 1850. *From the Academy of Natural Sciences.*

Bibliographia Zoölogiæ et Geologiæ. By Prof. Louis Agassiz. Vol. 2d. 8vo. London, 1850. *Ray Society's Publications.*

Message of the President of the United States and accompanying Documents. 8vo. Washington. Part 3d, 1849. *From C. T. Jackson.*

Report of the Commissioner of Patents for 1849–50. Part I. Mechanics. *From R. C. Winthrop.*

American Journal of Science and Arts. No. 30, for Nov. 2d Series. New Haven. *From the Editors.*

Journal of the Academy of Natural Sciences of Philadelphia. New Series. Vol. II. Part I. 4to. 1850. *From the Academy of Natural Sciences.*

Development and Homologies of the Molar Teeth of the Wart Hogs (Phacochærus) 4to. Pamph. By Prof. Owen. London, 1850. *From the Author.*

Catalogue of Shells contained in the Collection of John C. Jay, M. D. 4th Ed. 4to. New York. *From J. C. Jay.*

Message of the President of the United States, communicating the Report of Lieut. Webster of the Survey of the Gulf Coast at the mouth of the Rio Grande. 8vo. Pamph. 1850. Washington, D. C. *From R. C. Winthrop.*

Charter, Constitution, and By-Laws of the Troy Lycæum of Natural History, and Catalogue of its Officers and Members. 8vo. Pamph. New York, 1850. *From the Troy Lycæum.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. V. No. 5. pp. 81–115. *From the Academy of Natural Sciences.*

Report of the Exploration of the Territory of Minnesota. By Brevet Capt. Pope. 8vo. Pamph. (Congressional Document.) Washington, D. C., 1850. *From R. C. Winthrop.*

Deposited by the Republican Institution.

History of the Conquest of Peru. By William H. Prescott. 2 vols. 8vo. New York, 1847.

Works of John Adams. By Charles F. Adams. Vol. 2d. 8vo. Boston, 1850.

Cyclopædia of Anatomy and Physiology. Edited by R. B. Todd. Part 38. 8vo. London, 1850.

Received from the Courtis Fund.

Annals and Magazine of Natural History. 2d Series. No. 34, for October, 1850.

Annals and Magazine of Natural History. 2d Series. No. 35, for November, 1850.

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ERRATA.

On page	63,	3	lines from	bottom	*read* Daniel T. Curtis, Esq.
“ “	133,	9	“ “	“	*for* alcohol *read* sulphuric ether.
“ “	168,	7	“ “	“	*read* Increase A. Lapham.
“ “	181,	23	“ “	top,	“ recalled that the primitive type of the genus Cottus, was *C. gobio*, &c.
“ “	185,	28	“ “	“	*for* 456, *read* 156.
“ “	186,	27	“ “	“	“ IV. 1829 p. 498, *read* VIII. 1831, p. 498, *and add*, Griff. *Cuv.* Anim. Kingd. X. 1834, Pl. 43, fig. 3.
“ “	188,	3	“ “	“	*read Rallus Virginianus*.
“ “	190,	8	“ “	“	*for* Centrodermichthys *read* Centridermichthys.
“ “	235,	21	“ “	“	*for* shells *read* shales.
“ “	291,	17	“ “	“	*for* ten shells *read* two shells.
“ “	330,	10	“ “	“	*read Hylodes Pickeringii*.
“ “	341,	34	“ “	“	*for* cross formation *read* cross stratification.
“ “	354,	4	lines from	bottom	*read* seen in Bacillaria.
“ “	364,	14	“ “	top	*for* are *read* and.
“ “	365,	22	“ “	“	*for* Melebosis *read* Melobosis.
“ “	375,	5	“ “	“	*read* Poggendorff’s.
“ “	376,	5	“ “	bottom	*for* outer *read* inter.
“ “	378,	last line,			“ Phacochærus.
“ “	379,	22	lines from	top	“ Alumina.

ADDENDUM.

To the List of Patrons of the Society, page 1, should be added the names of Jonathan Phillips and Edmund W. Dana.